JAN 24 1916

# COTTON

Volume LXXX
Number Three
Ten Cents a Copy

JANUARY, 1916

Published Monthly by
W. R. C. Smith Publishing Co.
Dalton, and Atlanta, Ga.

## Whitinsville Spinning Ring Company

*Spinning Ring Specialists*

*The Best That Experience Can Produce,*
*That Money Can Buy*

**Whitinsville, Mass.**

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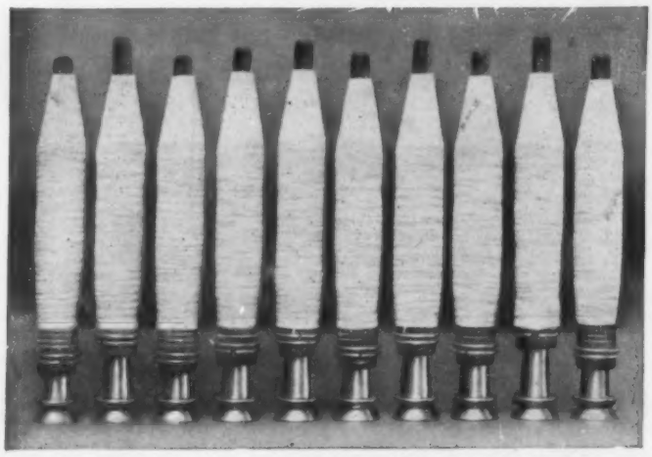
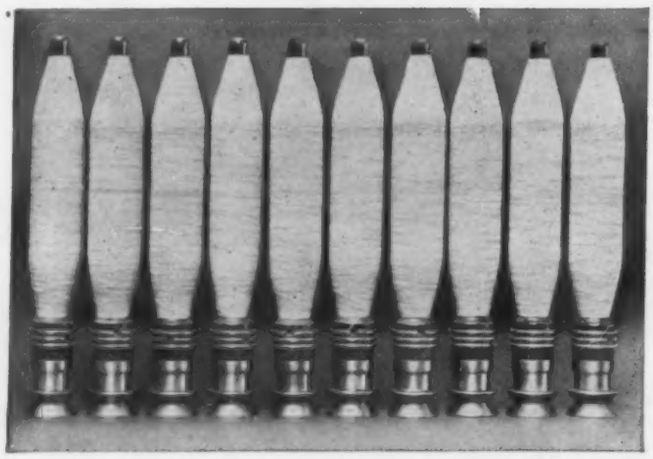


**WHY have the bobbins on your frames vary in height**



**WHEN by using Rabbeth Patent Centrifugal Clutch Spindles they would stand at one level and carry at least ten per cent. more yarn?**

# DRAPER COMPANY

**HOPEDALE MASS**

**J. D. CLOUDMAN Southern Agent**
**188 SOUTH FORSYTH STREET ATLANTA GA.**

JAN 24 1916



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# COTTON

Published Monthly by

**W. R. C. Smith Publishing Co., Dalton and Atlanta, Ga.**

**L. L. ARNOLD, Editor.**

Editorial and Advertising Departments Grant Building, Atlanta, Ga. Subscription price, $1.00 for two years; Canada, $1.00 a year; Foreign, $1.50 a year. Entered at the Dalton, Ga., postoffice as second-class matter.

Contributions to the columns of Cotton are solicited and paid for after publication. The names of contributors need not necessarily be used, but must accompany all manuscripts.

Orders for any change in advertising must reach Atlanta previous to the 10th of the month preceding month of issue, otherwise publishers cannot be responsible for changes.

When changing address, *notify us*, not the postmaster. Always give the old address as well as the new one.

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**Volume 80.** **Member Audit Bureau of Circulation.** **Number 3.**

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Poor commutation is common with ordinary brushes. You can avoid further annoyance by equipping your machines with

**DIXON'S GRAPHITE BRUSHES**

They are solid graphite of finest quality and contain no abrasive carbon. Commutators become as smooth as glass—sparking and grinding is eliminated.

Write for data sheet and booklet No. 34-M.

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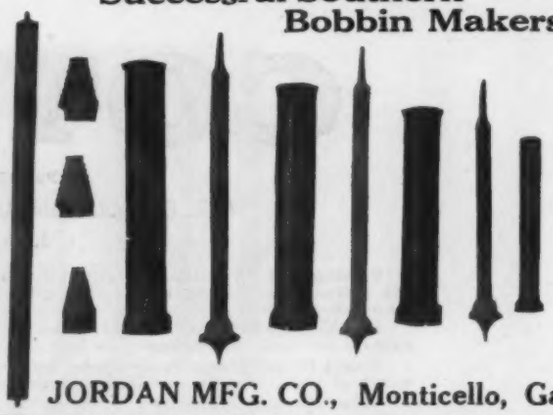
Established 1827.

M-23

**Successful Southern Bobbin Makers**



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FELTON CURVED FLOOR SWEEP

Insures Clean Cotton Waste

Made of a tough, long-wearing fibre, no particles break off and mix with the waste, as with corn brooms. This means a big saving for you.

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on a loom picker, loom harness or lug strap means that it has passed a most rigid inspection and is as

GARLAND G TRADE MARK QUALITY

good in quality of material and workmanship as it is possible to produce. Mill economy must include weaving efficiency. We can prove to you by the experience of many textile manufacturers that our products aid their success.

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***SACO, MAINE***

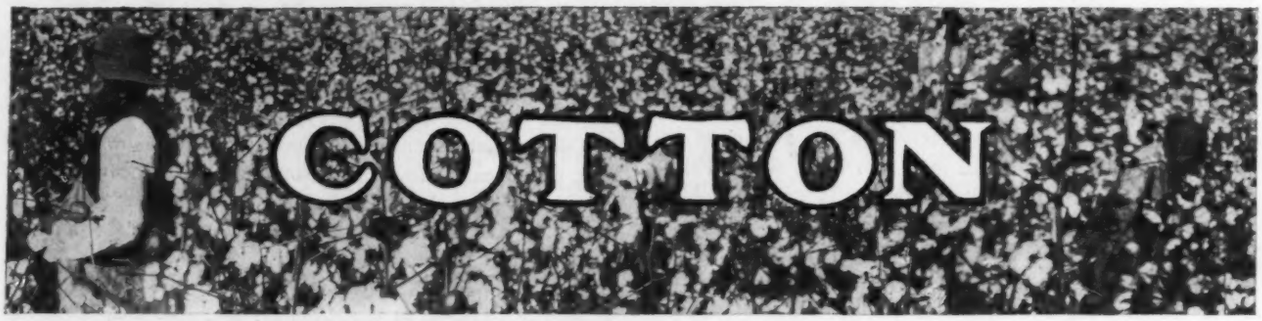
**ALLEN SAFETY SET SCREWS**

Don't wait until you have an accident. Equip your machinery now with Allen Safety Set Screws and protect your workmen. All diameters from ¼ to 1½" furnished. Any length, point or thread. Send for Circular No. 21 and free sample screws for testing.

**The Allen Mfg. Co.**

135 Sheldon St. Hartford, Conn.

JAN 24 1916




**January, Nineteen Sixteen.**

## Build for the Future.

When Fuller E. Callaway advised his associates, early last spring, that it was the accepted time to build a new mill, many people, North and South, more than intimated that his optimism was unwarrented by conditions. But, as the year grew older, other manufacturers sensing the present and future situation, also began to work on new mills and re-vamp old ones, until the last four months has seen more and better textile machinery business than the country has had for many years. And the end is not in sight, in fact, the beginning has scarcely passed beyond our angle of vision.

Nineteen-sixteen is holding out alluring prospects for the far-sighted investor. Many spindles and much machinery will be required. A new knitting mill and a new mill for fancy cotton goods, both to be located in North Carolina, will probably be open for bids sometime this month. Many knitting mills are doubling their capacity or more. Georgia has several big additions, fifteen to twenty-five thousand spindles, under way or contemplated. Some of them were reported in our Southern Mill Situation review for December. Others will be commented upon later.

All this preparation is not being done on optimism alone. The optimism is caused by and backed up with orders. Germany, as the largest knit goods producer of the world, is out of the running, temporarily at least, and her export markets are becoming the export markets of American manufacturers. It is probable, nay, certain, that after the declaration of peace, some of their business will revert, but some of it will stick. It will not require a very large percentage of foreign business to act as an adequate balance wheel for our factories in time of domestic depression.

Great Britain has dominated the world with its immense production of cotton yarns and piece goods, but, should Lord Derby's recruiting scheme be carried out to its logical conclusion, nearly the whole of the piecers and operative spinners of the Lancashire district will be called to the colors. This would undoubtedly mean the stoppage of a large number of mills. While some of these young men might be rejected by the medical examiners and while some effort is being made to form a *reserved list*, which will include the important textile operatives, still it is of interest to note that some of the district operative spinners' unions are setting aside the rule against the employment of women in mule spinning. An extension of female piecers is also gradually being effected, but British textile interests do not seem particularly hopeful.

A correspondent to the Textile Mercury writes: "There is considerable anxiety on the part of producers and distributors alike lest the demands of the recruiting sergeants and their voluntary helpers should deplete the works and warehouse staffs so much as to render continuance of ordinary business impossible." He says further: "We have an immense population in this part of the world who must be clothed and fed. Things must be kept going somehow, but it is in order to secure the continuance of *life* in Great Britain that so much young British life is being given up freely on our far-flung battle line. There may come a time when even the reserved groups must be called up. Then the fact of 'the grave inconvenience' must give place to 'the urgent necessity.'"

It is, therefore, evident that until the great European struggle is over, American manufacturers will be called upon more and more, not only to supply former customers of Great Britain, but even the British populace, who may, in time, be unable to supply their own demands. In this case, as in the German situation, the declaration of peace would immediately cut off much of our foreign business. It is doubtful, however, if either Germany or Britain will succeed in regaining their lost prestige in the textile markets of this country. It is also probable that some percentage of the export trade in piece goods will remain with us, although it will be well for American manufacturers to bear in mind the wise counsel of Howard Ayers in his export trade article in COTTON last May, when he said:

"If we are to have a permanent increase in our export trade it can come only because we can supply at competing prices what the foreign markets want. There is no sentiment in foreign trade, no enduring animosities can be depended upon. There must be the economic reason of successful competition on a purely commercial basis."

Therefore, these American manufacturers, who have shown their foresight and business ability, by their early preparation for the influx of orders just now beginning, must set their mark high and build for the future. Just as they foresaw, in times of near panic, the handwriting on the wall indicative of coming prosperity, just so they must foresee in times of plenty the true aspect of the conditions by which they will be entitled to hold their newly acquired business and build carefully, build strongly, *build for the future.*

## Where is "Down South?"

Helen C. Dwight takes her turn at the hammer in a recent article in "The Dodge Idea." She tells of two cotton mills and of the methods adopted by their respective managers. The location of the mills is given as "Down South" and the time "at present."

One of these mill men selected by the author as her hero, is just an average mill man who believes in compulsory education, says it is not economical to employ children under fourteen in the mill, and who will not stand for drunkenness in the mill village. There is nothing unusual about this man. You know hundreds like him and so do we.

After praising her "hero" to the sky, Helen proceeds to hand him this rather left-handed compliment: "At present the hero in his southern town has worked out the problems to his own satisfaction without knowing, in more than a hazy way, that the whole state of Massachusetts, to mention only one, more than lives up to the standards he has set for his single mill." Hard luck, Mr. "Hero"!

But it is when she comes to the villain of her story that this second Carrie Nation really brings out her ax. She says, "If anyone suggests to him that his operatives' homes and morals both need cleaning up, or that his operatives' children might better be in school than in the mill, he replies, 'they're my hands and you have no right to interfere.' Welfare work, schools, child labor laws and health regulations are to his mind simply obstacles in the way of working his hands as he pleases.

"And the result? The mill runs half-time when it runs and a good part of the time it is closed down altogether. The best workers have moved away. The remainder are distinctly low-grade. They live in houses disgracefully out of repair and in unsanitary conditions that have produced illness and death. Many cases of hookworm have been found in the village. A local doctor blames the mill for the death of several children within a short time. The consistent villain believes education is bad for his hands, so all efforts to encourage children to go to school are stopped in his village. Children 9, 10 and 11 years old work in the mill when it runs, in spite of the state's 12-year limit for work in factories. Morals in the village are at low ebb. Stockholders in the mill have signified their willingness to give away their shares rather than be identified with the mill. In short, the mill is on the verge of complete failure."

Wow! and again *Wow!* Where, oh, where *is* that "villain" and his mill? "Down South." Somewhere among the 970 thousand square miles in the southern states this mill is located—according to Helen.

Why won't she be specific?

Is it because she can't?

Or is she afraid of a suit for libel?

If this writer is prepared to prove the statements she makes and which are reprinted here, the man can easily be convicted under the state laws. Why not do so and prove the truth of this accusation—if it can be proven?

Who are these stockholders who wish to "give away" their shares rather than be identified with the mill? Who are the directors of the organization? Are they in cahoots with the villain? If not, why do they take no action?

Boil this story down to facts and we have nothing. As it stands it is merely rot. The most surprising part of the whole proposition is the fact that the editor of The Dodge Idea, himself a manufacturer, should have allowed such an apparently groundless story space in his columns. Can *he* answer the question, "Where is 'Down South'?"

## Trade Conditions in South America.

Commercial conditions in South America showed a distinct improvement in 1915 as compared with a corresponding period in 1914, according to data recently compiled by O. P. Austin, statistician of the foreign trade department of the National City Bank of New York. These improved conditions are more distinctly apparent in the reports of exports, as improvement in imports comes more slowly. The conditions on the import side, however, are much more favorable to this country.

In the single month of September, 1915, the total exports from the United States to South America were $16,939,000 as compared with $8,289,000 in September, 1914, and $12,093,000 in September, 1913.

In cotton yarn, the exports to South America show very remarkable gains having amounted to nearly a million dollars value in the last six months, while the total value of cotton yarns exported to South America in full year 1914 was but $51,493; in 1913, $160,117; in 1912, $179,088, and in 1911, $177,216, the total for one-half of the current year, being six times as much as in the full high record year, 1911, and nearly ten times as much as the annual average during recent years. This marked increase in the movement of cotton yarns to South America occurs especially in the trade with Argentina. The monthly figures issued by the Department of Commerce do not show the distribution of cotton yarns by countries, but a series of compilations made by the National City Bank, showing the exports from the port of New York to the South American countries, show the exports of cotton yarn to Argentina alone in May, 1915, $60,516; June, $82,838; July, $125,759; August, $71,559; September, $292,160, and October, $215,925. These figures are striking in view of the fact that the total exports of cotton yarn from the entire country to Argentina for the full fiscal year, 1913, amounted to but $88,813; 1912, $118,899, and 1911, $96,718. The exports of this article to Argentina from the port of New York alone now average as much per month as the full annual average in the last half-dozen years.

In cotton cloth the growth in exports to South America is not as encouraging as had been expected. It was assumed that the South American imports of cotton cloths from Germany, Austria-Hungary and Belgium would be entirely suspended and those from Great Britain, France and Italy greatly reduced, and that as a consequence, American cottons would find ready markets in South America. This, however, has not been fully realized. Doubtless the imports of cotton cloth from Germany. Austria-Hungary and Belgium are practically suspended and from Italy and France, materially reduced, but it is a fact that Great Britain continues to supply large quantities of cotton cloths to South America, especially the eastern frontage, while the movements of this class of merchandise from United States to South America have not shown the expected increase or as great an increase as for many other articles. The total quantity of cotton cloth exported to all South America in

the eight months ending with August, 1915, was but 33 million yards against 24½ millions in the corresponding months of 1914, and 33 million yards in the same months of 1913, thus showing no gain whatever in 1915 over the normal year, 1913, and but a slight increase over the corresponding period of 1914.

The absolute failure of the American cotton manufacturers to take advantage of their opportunity in South America is illustrated by the fact that Great Britain's exports of cotton cloths to Argentina alone in the nine months of 1915 are twice as much as those of the United States to all South America in the same length of time. Great Britain has been holding her own in the cotton goods markets of South America despite war conditions at home. The latest monthly statement of the British government show exports of 79,888,000 yards of cotton piece goods to Argentina in the nine months ending with September, 1915, against 79,469,000 in the same months of last year, while to the other countries on the eastern and northern frontage of South America, the figures show practically no reduction in 1915 when compared with 1914; to Chile and Peru, however, the British shipments show a considerable decline. The total exports of cotton piece goods from Great Britain to South America in the nine months of 1915 are six times as much as from the United States in the same period. In fact, the quantity of cotton cloth exported from the United States to all South America with its 55 million people is no greater than that exported from this country to Cuba with a population of but 2½ millions and but little over one-half as much as that exported to the Philippine Islands with a population of less than ten millions.

## Georgia Manufacturers' Association.

At the quarterly meeting of the Board of Directors of the Georgia Manufacturers' Association it was determined that the annual meeting of that organization should be held in the Assembly Hall, Chamber of Commerce Buliding, Atlanta, on February 10th next, to be convened at 10 o'clock a. m., and that it should be open to the attendance of manufacturers generally throughout the state, whether or not they are members of the association.

This action was taken in view of a feeling among officers and directors of the association, as well as members who were known to have expressed opinion on the subject, that the aims and scope of the association were not fully understood by all who represent manufacturing interests in Georgia, and that the presence of manufacturers who may have open convictions with reference to the advantages of organization along right lines, yet not affiliated with the association, would tend to harmonize their view and insure a larger and resultantly more effective constituency.

Having determined upon this course for the first annual meeting, a program has been arranged which includes addresses by the best industrial talent of the state; men representing large interests in the state, and who, through those interests, have contributed in large measure to its present industrial development. Those speakers have been chosen from among the association's membership, for the reason of their wide knowledge of internal affairs and the necessities confronting our manufacturers as a class.

In addition to instructive addresses to be made, committees will report upon subjects of common interest to manufacturers, involving not alone questions concerning their immediate welfare, but as well the industrial welfare of the state, each having far-reaching economic importance. These subjects will be dealt with, and the policy of the association with respect thereto determined upon.

If manufacturers generally throughout the state will attend this meeting, it will afford in a way more comprehensive than any other, a means to a better understanding of the purposes of the association, and go far toward enlisting in its cause, the cordial support of a greatly increased membership.

The Georgia Manufacturers' Association takes the stand that something is necessary among manufacturers of the state to preserve an even balance between themselves and that class of demagogues who so continuously cry for the statutory regulation of enterprise. There has grown up to be such a formidable array of these that individual effort against them is a fruitless task. The rights of the *manufacturer* cannot be safeguarded in any other way than by solidarity in purpose and cohesion of effort. It is the right way and the only peaceful way by which they can hope to hold a check upon the errors and excesses of government, superinduced largely by that unwholesome influence found in the "balance of power" at the ballot box. The class that wields this power is strongly organized, maintaining district advisory councils throughout almost every state in the Union, demanding subjection of all followers to the will of their leaders. This influence, of common knowledge, has shown steady increase, and should alone be sufficient to suggest the importance of organization among manufacturers and employers to combat it.

With preparations on hand for the meeting of Georgia manufacturers on the 10th, under the auspices of the Georgia Manufacturers' Association, it is believed there will be a great rally of interests, to enlist in the common cause of all, and in the interest of self-protection, as well as maintaining inviolate those enterprises of the state, both great and small, that insure its industrial supremacy.

## The Boston Show.

Boston is making elaborate plans for the reception of the many textile men who will visit the Hub during "Textile Week," which is scheduled for April 24 to 29, 1916.

All details of the program have not been worked out at this time but from the interest that has already been shown it is clear that many men, who are vitally connected with this field of commercial activity, will be in Boston during the week. Invitations have been extended to the various organizations in the Textile field to hold conventions during "Textile Week." The National Association of Cotton Manufacturers have already made known their intention of doing so and several other organizations will decide the matter in the near future. The success of the coming exhibition has long been an assured fact for within a week after the first public announcement almost 75,000 square feet of space was sold. Less than a quarter of the entire allotment remains according to Manager Chester I. Campbell, who predicts that every inch of available space for exhibition purposes will be disposed of a month before the doors open.

**$5.00** Imported High Speed Indicator Outfit in Case

**FREE** To You for a few Minutes of your time.

Our Service Department desires the opinions of active mill men on the quality of the work shown in the advertising pages of this issue of COTTON.

We are, therefore, going to give this indicator for the best letter by a mill executive who gives the clearest and most definite reasons why, and in what manner, any certain advertisement is, in his opinion, the best.

Contestants must be mill executives, from overseers to presidents, connected with spinning, weaving, knitting, or finishing plants. The letter must be accompanied by the name, address and official position of the writer in order to be eligible.

The judges will be the Editor of COTTON and the Manager of the Service Department, whose decision will be final.

Address Contest Department of COTTON, Atlanta, Georgia.

The winner of the advertising contest prize for November, 1915, is W. E. Williams, overseer of twisting and winding at the Louisville Cotton Mills, Louisville, Ky. The following gentlemen are given honorable mention: Albert J. Owler, overseer of carding, Providence, R. I.; William C. Bennett, overseer of carding, Shelton, Conn.; C. W. Moore, overseer of cloth-room, Magnolia Miss.; W. W. Cobb, overseer of spinning, Union, S. C., and one other writer who signed himself Superintendent, Lauderdale Cotton Mills, Meridian, Miss., but who failed to sign his name to his letter, thereby becoming ineligible as a contestant.

The contest announcement is repeated in this issue and contest letters are eligible in this competition if received before or on February 15, 1916. Letters received later than February 15, will be barred from the contest.

## The Winning Letter.

The Graton & Knight Mfg. Co., Worcester, Mass., has, without a doubt, the most attractive and up-to-the-minute advertisement that your textile journal for November contains; that is in my opinion, of course. If I am able to explain my thoughts in the right way in regard to this advertisement, there is no doubt that others will see it in the same light.

I will try and give my reasons why I consider it the best.

First, they have a full page.

Second, the words at the top of the page, "Wait A Minute, Mr. Cotton Mill Man," cannot be overlooked by the up-to-date superintendent.

Third, there is good sense in the first two lines.

Fourth, the next two lines answer the question asked in the first two lines.

Fifth, they next show that they could sell their belting cheaper if they would lower the quality.

Sixth, they will put their belting up against any other belting on the market.

Seventh, they guarantee absolute satisfaction. What more could one do?

Eighth, they ask if they can send a trial belt for the hardest drive in your mill, and that is surely saying something, (the quarter-turn is a very hard drive).

Ninth, every word is good business argument and will be seen and read by the mill man.

Tenth, the advertisement might be equaled, but in my judgment there is none better and more business-like in the journal.

Louisville, Ky., December 20, 1915.

L. L. Arnold, Editor COTTON,
Atlanta, Ga.

Dear Sir:

Your letter of the 18th inst., notifying me that my letter has been selected as the winning letter in the November advertising contest, received. I was delighted to learn that I was the winner. I have also received the indicator and I must say that it is "just grand," in fact, I cannot express my appreciation in words.

Wishing you much success and prosperity, I am,

Yours truly,

(Signed) W. E. Williams.

# Industrial First Aid and Safety Welfare

BY HERBERT J. WATKINS.

It is estimated that in this country 66 per cent of accidents are due to negligence of employers and employees, and 34 per cent to the inevitable risks of employment. It should therefore not be necessary to prove that attention to learning how to prevent accidents will pay. Nor should it be any more difficult to prove that knowledge of First Aid will pay.

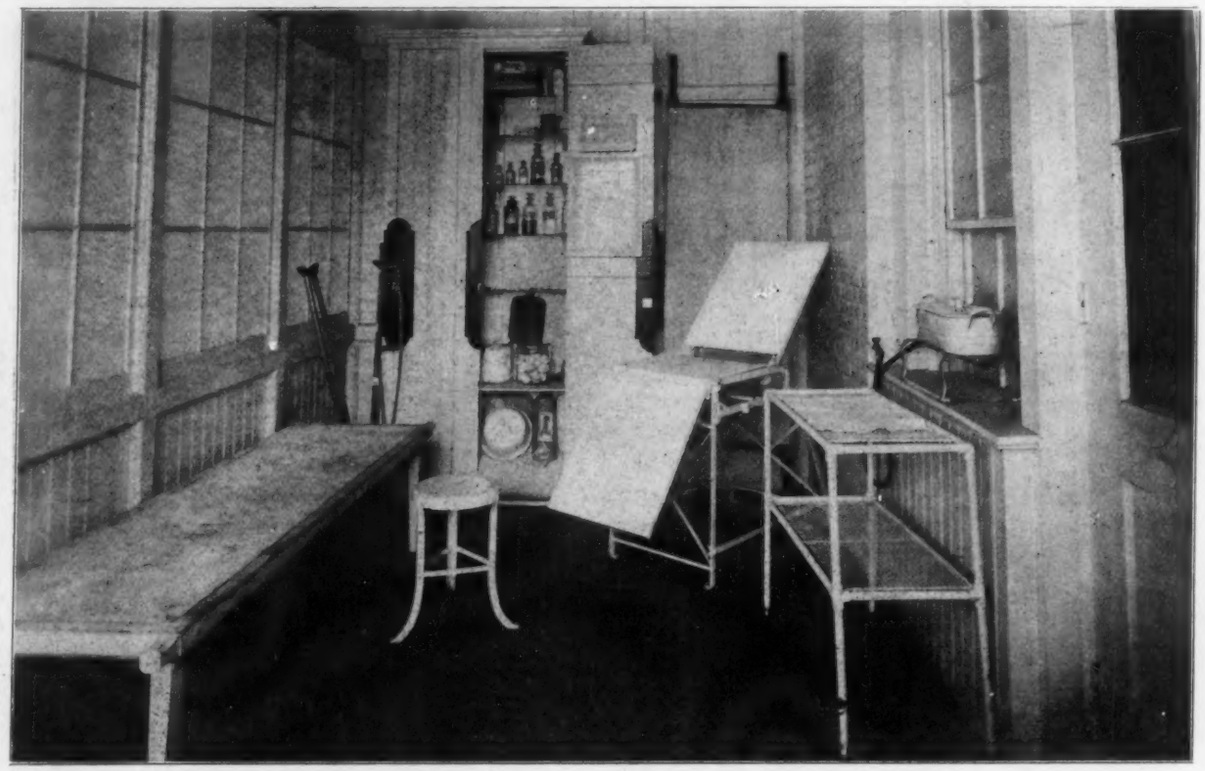
It is well to remember that in a great many cases of accident the treatment given in the first few minutes may decide whether the patient will live or die, and it is also well to remember that first aid consists in learning *what not to do* as well as learning *what to do* in case of accident.

Newspapers, periodicals, and magazines published the world over have recently devoted much space to articles on "Safety Welfare," "Safety First," and "Industrial First Aid," but almost invariably have treated the subject in a very general advisory manner, and have neither given or offered to give any assistance to their readers as to methods of promoting the work.

"Prevention is better than cure" was never more true than in the case of industrial accidents, but there is another equally as true in the case of the manufacturer, and that is, "You can build or change the construction of a machine so as to make it just as accident proof as it is possible and still be enabled to operate it, but you cannot make it *fool proof*.

The compensation system in the several states waives the question of fault, unless the accident is due to the willful intention of the employee to injure himself or another, or unless it is due wholly to intoxication; conditions which are practically impossible to prove. The employer is required to pay compensation irrespective of fault.

In the fall of the year 1914 the American Mutual Compensation Co., of New York, decided to protect the interests of their clients, by taking advanced steps to promote "Safety Welfare" and instruct employees how to perform first aid in the proper manner. They have undoubtedly set in operation a movement which will become nation wide in the near future. The city of Utica, New York, was chosen as the place to try out the experiment, and the work accomplished there has been of such a successful nature that plans are under way to continue it in all of the cities of the state.



FIRST AID ROOM AT THE MOHAWK VALLEY COTTON MILLS, UTICA, N. Y.

The history of this movement should prove of great interest to manufacturers throughout the country, for an association of manufacturers in any city could accomplish the work done at a very nominal cost.

With the consent and cooperation of the manufacturers it was decided to form a class to take a course of instruction in first aid; this class to be formed of at least two high-grade employees to represent each corporation. Permission was obtained from the American National Red Cross Society to conduct the work under its auspices and the

We are indebted to the generosity of Dr. H. H. Lenahan, the authorized Red-Cross instructor of the City of Utica, N. Y., for the photographs which are used to illustrate this article. Dr. Lenahan prepared these photographs to illustrate a book on first-aid especially devoted to work in the industrial field, which he now has in course of publication.

regular Red Cross Instructor in the city was appointed in charge.

The text-book on First Aid (Industrial edition) of the Red Cross Society was used, and at the end of a course of ten lectures, an examination in practical and theoretical first aid was held; a physician and surgeon appointed by the Red Cross Society conducting it. Ninety-four per cent of the students were successful in passing the examination with a percentage of 75 or over, with the result that every corporation that had representatives taking the course have in their employ at least two men who hold Red Cross First Aid Certificates, and are thoroughly competent to take charge of the work.

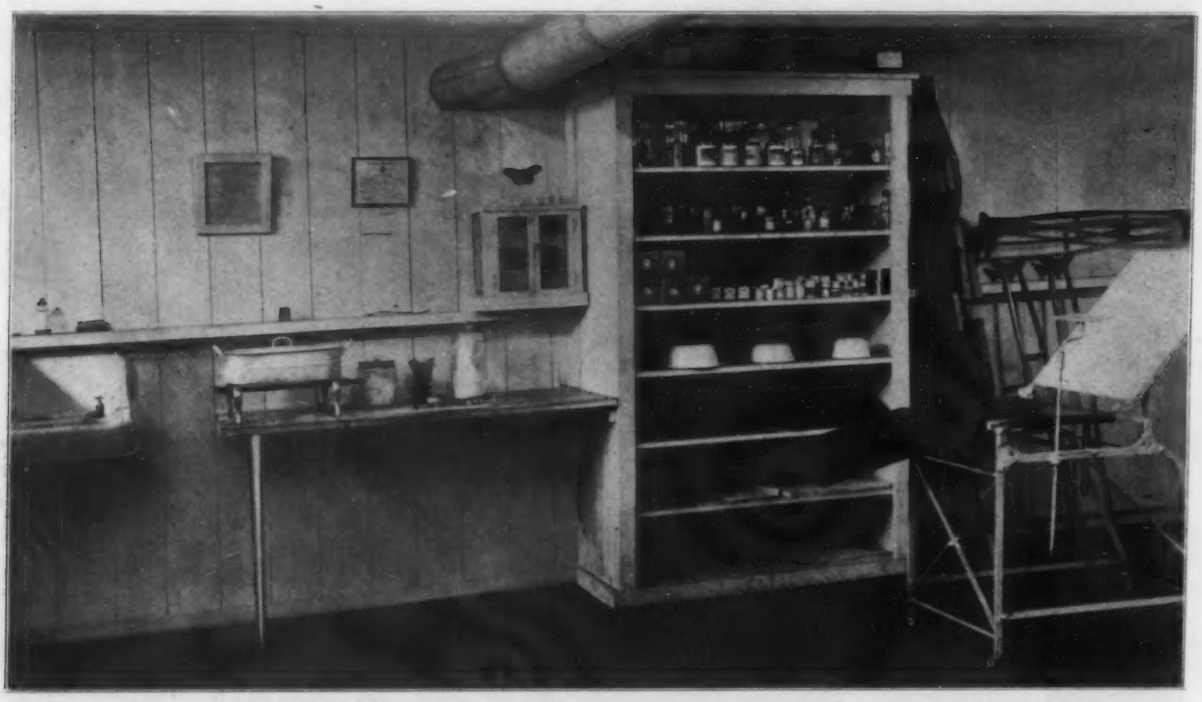
Still further, the surgeon in charge had acquired a vast experience in mill accident work and deviated from the regular routine with a special course for the students' benefit upon the common and special accidents which occurred at their individual plants.

The "calamity howling" "crape-hanging" readers of this article will here pause to make the statement that of course there is no necessity for any such elaborate training as this; that they have their regular mill surgeon and will continue to send their employees to him when injured, and this was true in one or two cases even in the city where the experiment was tried out, but as soon as the practical work was under way, even the pessimists had to concede that the movement was going to prove a success.

In the majority of plants the purchasing of equipment was started upon a small scale, but when the manufacturers realized the efficiency and competency of their first aid men; when they saw the saving in time and labor of injured employees, who either had to stay away from work through infections setting in from neglected minor injuries, or lose time to go to a surgeon's office to have their wounds dressed (for their first aid men not only practice first aid now, but take care of all accidents that do not need special medical or hospital attention); when they were shown the appreciation by the employees of the manner in which their injuries were cared for; and lastly when the possibility of reduction in their insurance premiums due to the fact that the number of tabulatable accidents charged against them were decreased; the question of finance for equipment was very easily decided, with the result that in the city of Utica and the neighboring towns fifteen first aid rooms were established with an equipment similar to those shown in the photographs, and no single one of these plants employ over a thousand people.

Generally the outfit consists of 1 stretcher, 2 pairs crutches, instrument sterilizer and boiler, solution basins, operating chair, drug cabinet, splints, splinter forceps, dressing and artery forceps, skin clamps, glass jars for cotton and gauze, bandages, gauze, absorbent cotton and adhesive plaster.

The drugs consist of all the common antiseptics, oils, powders, acids and ointments used in the care and treatment of wounds.



FIRST AID ROOM AT THE SKENANDOA COTTON COMPANY, UTICA, N. Y.

It has been the custom in the past, and this method is, of course, still advocated in the majority of factories, to purchase either a large First Aid outfit box at a cost of about six dollars and to centrally locate it in the plant, or to purchase small outfits at a cost of about one dollar and have one placed in each department. Much can be said in favor of these outfits in cases where it is necessary to have them so that they can readily be removed from one place to another, or where accidents are a rare occurrence, but in factories where injuries are numerous and the kit is more or less in constant use, the contents are soon exhausted and have to be replenished with supplies from a drug store.

For the benefit of the readers of COTTON who are progressive enough to wish to install an equipment on a small scale that will suffice in ordinary emergency and that can be installed at a nominal cost I would suggest from experience the following method of procedure.

ON THE LEFT, THE FIRST AID ROOM OF THE NEW YORK MILLS COMPANY. AT THE RIGHT IS A VIEW OF A SIMILAR ROOM AT THE PLANT OF THE ONEIDA BLEACHERY AT NEW YORK MILLS, N. Y.

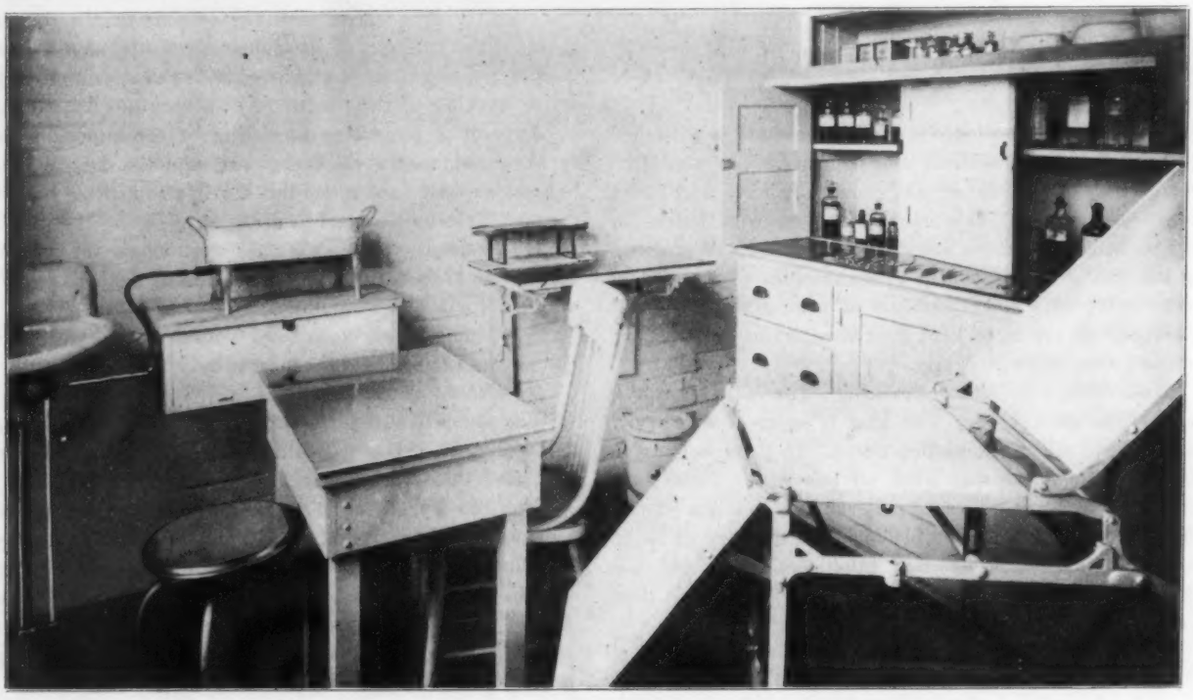
First. Make an effort to get one or two of your high-grade employees who are able to devote a few minutes occasionally from their regular routine of work, and who are not members of the organization that are afraid of the performance of extra duty without an immediate increase of 100 per cent in salary, interested in the movement. Those selected should be willing to make somewhat of a study of first aid.

Second. Have your carpenter build a cabinet in the room which you now call the Hospital in your plant, and purchase the following supplies: 4 ounces tincture of iodine, 4 ounces aromatic spirits of ammonia, 8 ounces pure alcohol, 4 ounces carbolated vaseline, 1 pint of carron oil, 4 ounces bi-carbonate of soda, 4 ounces pure carbolic acid, 8 ounces pure glycerine, ½ pound of 1 inch and ½ pound of 2 inch gauze bandages, 4 ounces of absorbent cotton, 4 ounces of sterilized gauze, 2 rolls of 1 inch adhesive plaster, 1 pair of scissors, 1 splinter forceps, 1 dressing forceps, 1 probe, 1 box wood applicators, ½ dozen skin clamps, 1 pair crutches, 1 tourniquet and 1 folding cot stretcher. It is also well to have on hand a set of splints of various lengths and widths made by your carpenter in case of fractures.

This would be enough of an equipment to commence the work, as it will gradually increase according to the experience your men will gain through practice, and the point of efficiency they will reach.

TREATMENT OF WOUNDS.

I have found the following generally to be a very successful method:



FIRST AID ROOM AT THE ONEIDA KNITTING MILLS, UTICA, N. Y.

*Incised wounds* (made by a sharp instrument or knife). Wipe the surrounding skin with 50 per cent iodine and gasolene. Do not wash with any solution under any circumstances. Wipe away from the wound with iodine solution. Now saturate a cotton sponge with pure tincture iodine and apply directly to the inner part of the wound. Cover the wound with plain gauze or gauze soaked in alcohol. Bandage.

*Lacerated wounds* (torn by becoming caught in gears, etc.) Use iodine to clean skin as before and pour iodine into the wound, cover with a compress with vaseline dressing if there is much bleeding, as it will prevent the sticking of the dressing when it is to be removed.

FIRST AID ROOM AT THE STATE STREET PLANT OF THE UTICA STEAM AND MOHAWK VALLEY COTTON MILLS, UTICA, N. Y.

*Punctured wounds* (those made by nails or blunt instruments). First swab the skin with iodine as usual, then pass a probe carefully into the wound with a small amount of pure carbolic acid on it, and wait 30 seconds, then pass same probe in wound with alcohol on it. This will neutralize the acid, so that it will not burn the tissues, and still will stop infection.

*An Infected or poisoned wound* has around it a swelled and reddened area for about 2 or 3 inches. The wound itself usually has plenty of pus coming from it and has a dirty looking base. This can be treated with iodine or pure carbolic acid, and a wet dressing applied. Wet dressing consists of 1 teaspoonful tincture iodine to the pint of boiled water with 3 teaspoonfuls of pure glycerine added. The dressings are to be kept soaked with this solution and changed once or twice a day.

*Granulating or clean wounds.* The skin margin is healthy and growing in. The base is covered with a red, lumpy tissue called granulation tissue. In these wounds, or infected wounds, we may wash off pus with solution, and here is the place where washing is valuable to clean off pus. The solution may be 1-1000 bichloride of mercury or iodine —peroxide may now be used intelligently, for in cases where pus is present it is alone valuable. Never put it on a clean wound.

*Burns.* Swab the reddened area with carron, oil which is a solution of linseed oil and lime-water. This will remove the pain. Exclude the air by using a thin paste made with water and bicarbonate of soda. Ordinary vaseline, olive or castor oil, fresh lard or cream are all good. A light bandage should be put on to hold this dressing in place.

For a text-book on first aid methods to be generally applied in cases of fractures, hemorrhages, shock, etc., I would advise a study of the American Red Cross abridged text-book (Industrial edition), by Lynch & Shields, of the Medical Corps of the United States army.

### SAFETY AND WELFARE.

This is the generally advocated branch of the work which comes the nearest to "red tape" of all for the reason that in every movement that is started there will be persons who carry things to extremes.

I have seen cases of machines being guarded in such a manner that the operator in oiling would have to thrust his hand over or under a fixed guard, and would have his fingers drawn into and crushed by the gears or belts for the reason that he could not see the danger and did not know where he was placing his hand, while if there had been a sensible guard, or no guard at all, and there was a possibility of danger, he would be able to perceive this and govern himself accordingly.

In the cotton factories today, particularly where the help employed are of such a cosmopolitan nature, "suggestion boxes," "slogans," "literature," etc., distributed and posted throughout the plant are not of as much value, generally, as the paper on which they are printed. About all the suggestions you would get would be for more pay and less work. The state factory inspectors and insurance companies will see to the manner of forcing you to place enough guards around your machinery, so that you will have no need of suggestions for places to install more of them.

It is well, however, to have the safety and welfare of your employees at heart, and none are more competent to take care of this matter than the officials of the corporation and the foremen of the departments, the men who are deemed competent to be entrusted with the operation of the entire working of the plant.

Appoint a committee consisting of the superintendent or his assistant, the chief engineer, and the first aid men, to meet at least once a month. To this committee have the foremen present each month a report of—

1. Accidents which have occurred since the previous inspection, their nature, and what suitable methods could be adopted for their prevention.

2. Condition of machinery, floors, etc., as far as the prevention of accidents is concerned.

3. Other remarks.

The committee could then proceed to investigate methods for overcoming the difficulties reported by the foremen and have them remedied.

You can try all the methods of safety and welfare with the fancy trimmings that will be suggested to you, but you will find that their practical value will never be at a premium. Adopt common sense methods for the safety welfare of your employees, but be well prepared to take proper care of the accidents that are sure to happen as long as you employ labor to operate machinery.

# On the Eve of Prosperity

BY COL. ROBERT J. LOWRY.*

As we all know, the spirit of optimism is an essential prerequisite of success in any line of endeavor. Not only is it desirable and advisable to cultivate a spirit of hope and good cheer, but it is imperative, if an individual or a nation makes substantial progress towards success. The traveling salesman should first go out behind the barn, and sell himself, before he ever approaches a customer. He must believe in his goods, believe in his ability to sell them, and believe he is going to sell them, before he can make a success. He must be optimistic enough to believe in success, and then aggressive and progressive enough to achieve it.

At heart an optimist, I believe the great section of this country called the "South" is on the eve now of great agricultural and manufacturing development. Really this whole country, I am convinced, will prosper greatly as a direct result of the great fractricidal strife across the water, much as we regret the war as an exciting cause of our prosperity. The South, filled with a joy born of her present and prospective prosperity, entertains the warmest feelings of affection for all sections of this great country, and feels that in the joining of hands, and the marching in one solid column, united in effort and sentiment, all sections of this glorious Republic will together work out a common destiny, a rebuking object lesson to the heartless militarism of Europe.

COL. ROBERT J. LOWRY.

I say, it is unfortunate that the dreadful war in Europe will be a direct cause for unprecedented prosperity in this country. Still, I make bold to say that, in view of the enormous crops and the energy and optimism of our people, if there were no war in Europe to create a demand for supplies for war, this country would prosper beyond the most Utopian of dreams. Last year at the beginning of the cotton season no market appeared open for this great staple of the South. It went down to six and seven cents in price, and a general depression prevailed, due largely to the shock of the foreign conflict. Now the people have accepted the war as a condition, just as they would accept the weather as a condition, just as they would accept crop pests as a condition, and, having regained their composure, they are going forward toward the substantial prosperity, which they so richly deserve. Cotton has risen in price to twelve cents a pound and more, and there is no reason why such a slump should again take place, unless the farmers should be lured by the good price to plant an excessive crop next season.

The secret of our progress and success has been diversification during the past year. In November last we held a week of "Harvest Festival" in Atlanta, which was an eye-opener to many pessimists of our section. The evidences of plenty, the spirit of enlightened publicity, the hope and good cheer of that occasion, were sufficient to make the pale blood of the croaker redden. It was a celebration of the return of that prosperity, which diversification pointed out. Our smoke-houses and corn cribs are well filled; we have more and better live stock on the farms; we have better soil. Our farms have given up an abundant yield; our industries are returning to normal working hours and wages; and our people are more content; they are buoyant. They enter upon this New Year with the glad hope born of confident assurance. Accepting conditions as they are, they have learned that economic conditions in any section depend upon its resources and its people, and proceeding along the line of this idea, I am sure that the coming year will be a prosperous one for the South.

The dawn of a New Year is always the opening of the door of "eternal hope"; and there is always basis enough to entertain a reasonably fond hope of success for the reason that as long ago as the birth of this world, Nature promulgated a great law of compensation, which makes up for every deficiency of means which may be at our command to attain legitimate ends. When your sight is gone, your sense of feeling is doubly keen; when your hearing is gone, your sense of sight is unerring. The diversification of crops in the South, the consequent decrease of cotton acreage within reasonable bounds, and the activity of the farmers along the "live-at-home" plan, have served to make up for an apparent lack of a cotton market, and increased the price of the money crop. If this plan is continued during the coming year, we will have a repetition of the abundant harvest and plentiful yield of last fall. Our people can accept the responsibility of the burden of the New Year with the assurance that, if they continue in the future as they have in the recent past, the country will prosper, for the law of supply and demand is the only yardstick by which to measure affluence, and prosperity is but another way to spell plenty.

It would seem reasonable for even a doubtful mind to admit that all conditions in this country foretell decided improvement financially and economically. When our peo-

*Colonel Robert J. Lowry, pioneer of Atlanta, and president of the Lowry National Bank, came to Atlanta from Greenville, Tenn., in 1861, at which time he established business in the old Athenian building on Decatur street; Atlanta at that time boasting of a population of approximately 11,000 people. Colonel Lowry holds the distinction of watching Atlanta grow to the magnificent proportions it has now assumed, while an increase of $1,000,000 in deposits at his bank in the past year, and the payment of $120,000 in dividends to stockholders during the year, are a great tribute to his personality and business acumen.

ple took hold of the situation as they saw it with the determination, in spite of conditions, to make a success, by diversifying the crops, reducing the cotton acreage, paying as they went, and raising products for home consumption on the farm instead of raising cotton and buying them, they opened a way for substantial progress, which has already shown results. This conservative policy at home, and a growing demand for supplies abroad, must make for continued prosperity.

One of the most gratifying indications of the stable conditions, which surround us, and the probability of a continuation of substantial prosperity, is the fact that, as a general proposition, our people are paying their obligations as they mature, and there have been fewer cases of bankruptcy during the past 12 months than during any similar period of time since the bankruptcy law was put into effect. It will be recalled that it was freely predicted at the beginning of this war that the lack of a cotton market would force thousands into bankruptcy. This did not prove to be true for the reason that our people made up their minds to meet the situation like men, to live economically, to buy less of the necessaries of life that should be raised at home, and to be conservative and prudent. Each man seemed to make up his mind to be essentially an optimist, and to endeavor to be satisfied with conditions as they existed, and to meet his obligations as promptly as possible, and thereby enable every other man to do the same. The bankers have been agreeably surprised at the spirit of the people, which has shown a marked determination, despite a possible excuse, to pay their debts. Collections by the banks during the fall just passed have been good, and the financial condition of the banks of the country is quite satisfactory.

I might mention in this connection the fact that one gratifying result of the war conditions in Europe has been the awakening of the American people to the fact that they have depended upon Europe in years past for many things that could have been manufactured at home. The supply of many articles of daily commercial use was cut off by the cessation of European shipment, and their supply is now being furnished by American factories. We have lost in the years gone by millions of dollars worth of manufactures by reason of our dependence upon foreign production. As we have started in a very substantial way to meet our home demand through home manufacture, and as it will be at least a long time before foreign production could become normal, even upon an immediate cessation of hostilities, our home demand will have become educated to the home product, and much of this business will never again be done abroad. Indeed I am inclined to think that this country will be supplying many of the countries now at war with articles of commerce, with which they heretofore supplied us. Many of these factories will, after the close of the war, be supplied with skilled foreigners, through immigration, who have worked the greater part of their lives in similar factories abroad. This will strengthen American commerce at home and abroad, and give a boost to manufacturing enterprises, which at present are more or less experimental in America.

Another gratifying condition, which means much in the estimation of far-sighted economists, is the cultivation of the trade of South America. Long has this opportunity knocked at our doors, and long have we neglected the call of the Latin-American trade. Doubtless this would not have been the fact, if the English language had been spoken throughout the western world. Doubtless it would not have been the fact if international commercial relations could have been easily established, as they would have been had the population been homogeneous. However, we have in the past allowed European enterprise to take this trade bodily, meeting the conditions as they found them, while we have followed the path of least resistance. The pan-European war, however, has caused us to awaken to the possibilities of this market, and negotiations are now rapidly tending toward the most cordial commercial relations between the United States and Latin-America. We will not enjoy a very large trade with Latin-America for years to come, and we cannot begin to enjoy what we ought to have until we have a strong American merchant marine. This must come, and it will come, and we will dominate the trade of South America in time, although it will take time to establish it. It is pleasant to note, however, that the spirit of apathy of our people to this magnificent opportunity has disappeared, and we have made a substantial beginning toward the development along permanent lines of commercial relations with this great market. This is a particularly inviting field for the cotton goods manufactured in our southern section, and they are in demand already. Our manufacturers of cotton goods may be termed pioneers in the development of South American trade, and they have determined to meet the demands of the trade there, and build up a business worth while. This is certainly a very gratifying step in the right direction.

It is further gratifying to note that the war in Europe has caused the American people to awaken to the fact that it is not necessary to stand with folded arms and await a cessation of the armed conflict before we turn a wheel. This country is inherently great enough to stand alone, and there is no occasion for commercial stagnation here because chaos reigns in Europe. We can feed and clothe the world, and indeed the warring nations have looked to us for the financial backing necessary to carry on the war. They have borrowed money from us to buy our supplies, making them doubly our debtors, and us their double source of supply. Aside from the fact that this may be occasion for national pride, it is an insurance against the blight of business depression.

It has been a most gratifying condition to observe the spirit of hearty cooperation between the banks and the cotton-growers, as well as to note the substantial cooperation of the Federal Government with the farming interests. It was indeed a most gratifying move on the part of our Georgia Legislature, in its extra session, to provide an appropriation from state funds to meet the provisions of the Smith-Lever Act for government aid to our farmers. After all, the basis of all national wealth from the viewpoint of initial production is the farm, and appropriations for farm demonstration work are never wasted, however large. To teach the farmer right on his farm how to make two ears of superior corn develop on the very spot where he had before made one ear of, perhaps, inferior corn, is a work of such national importance as to merit the loyal moral support of every good citizen. Through government cooperation with the individual states in the development of their natural resources this country will con-

*(Continued on page 104)*

# Principles of Beam Dyeing*

BY LOUIS JOSEPH MATOS, ME., PH. D.

The dyeing of cotton yarn in the form of warps on the beam is gradually receiving more attention from manufacturers of cotton goods on account of the possible saving in several directions, especially in the handling. On the other hand, it must be remembered that warp dyeing on the beam is practically a new departure in dyeing, and while it has been in use for several years, it is still regarded as being in its infancy, and that the future will undoubtedly show a degree of development in that line of work not heretofore paralleled by any other previously known method of dyeing. While the art of dyeing warps on beams is receiving so much attention from dyeing machine builders and cotton dyers, we must not lose sight of the fact that there are other advanced methods of warp dyeing, very remote from beam dyeing, that likewise possess distinct merits, and which may possibly prove, in time, a strong competitor of the beam dyeing method.

The present article considers the principles of beam warp dyeing, with special reference to the factors and conditions necessary, or at least, those that have been found best suited to maintain a proper balance between the mass of material to be dyed, and the dye solution.

The uniformity of beaming is a mechanical condition, and requires the very greatest possible care on the part of the beamer. It must be remembered, however, that absolutely uniform beaming is one of the most difficult textile operations, and it is only by accident that two warp beams may possess the same density.

A well wound beam should always have the same density throughout every part. There should be no portions of the warp that have been wound under greater or less tension than others. There should be no loose threads (not necessarily broken ones). The tension of the selvage threads should be exactly the same as those of other parts of the warps. It frequently happens that selvage threads are of a different count than those of the body of the warp, and this difference will be the direct cause of distinct mechanical unevenness, if not responsible for other forms of unevenness showing plainly in the finished pieces.

Every precaution should be taken to overcome the tendency to produce a warp on the beam that is wound tighter at the center than at the surface. This condition is illustrated in Fig. 1. This condition is difficult to overcome, and under the present system of beaming it must continue to cause the existence of a gradually decreasing density toward the outer laps.

Just what constitutes the most satisfactory density of a dye solution intended for warp dyeing on the beam has not been definitely determined, for while the working conditions of many successful dyeings are recorded, the exact condition for each warp must necessarily vary.

It is evident that working with a solution of dyestuff and the necessary chemicals aggregating four (4) ounces per gallon (4.8% sol.), the results will necessarily be somewhat different than when using a solution containing only two (2) ounces per gallon, other conditions being exactly the same. When the density of the material on the beam to be dyed is absolutely uniform from center to surface, and from head to head, the distribution of the circulating dye liquor through the thread mass will meet, in consequence, the same resistance in every part, and consequently the absorption of the coloring matter from the dye liquor will be correspondingly uniform. Where soft spots exist in the beam, due to whatever cause, the moving liquor being less rapid through such "spots," allows a longer period of contact, and consequently an apparently greater penetration.

LOUIS JOSEPH MATOS.

In the accompanying illustration, Fig. 2, we have an instance of a beam, to all appearances wound in a satisfactory manner, but in the body of which are two regions where the winding is not as tight as in the remaining parts, and in consequence this portion offers less resistance to the flowing dye solution. In the soft parts of the beam, we have a condition not unlike the electric circuit that has an area of lesser resistance between two areas of higher resistance. The movement of the solution in the portion of low resistance being slower than in the high resistance regions. The theory of this is illustrated in Fig. 3.

Without any reference to other conditions, it is an accepted fact that the harder a yarn is spun and twisted the more difficult it becomes for a dye solution of a given density to penetrate to its center. In the case of cotton, the degree of penetration depends very greatly upon the influence of capillarity, and this is materially governed by the hardness of the twist of the yarn. The harder the twist, the closer the individual fibers are compressed together, and therefore the greater the compression, the less

*In substituting this article for the one on the "Effect of Dyestuffs and Colored Yarn on Slasher Blankets," We Desire to announce that it was done in order to allow the author time for a more complete investigation of this interesting subject. The article in question will be published in a later issue.—Editor.

opportunity there is for dye solutions to work their way between the fibers. This property of capillarity is lost sight of in comparing the dyeing value of many coloring matters, and particularly those, that under certain conditions, show a tendency to become colloidal in character, as opposed to those having crystalloidal tendencies.

In considering the penetration of cotton yarn by dyestuffs, we find in practice that better color penetration results when weak dye solutions are employed, coupled with a prolonged immersion in the dye bath. In such a case, the

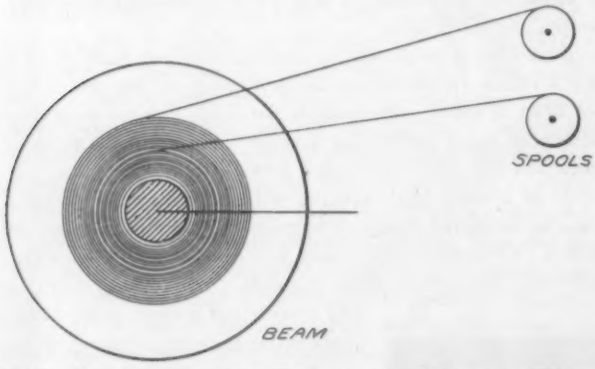



FIG 1. ILLUSTRATING THE TENDENCY OF WARPS TO WIND TIGHTER NEAR THE CENTER OF THE BEAM.

element of time plays a most important part.

In specific instances, especially when the substantive or direct dyeing group of colors is employed, the general custom in dyeing cotton, is to make an addition of common salt or Glauber's salt to the dyebath in such quantity as to cause the cotton to take up the coloring matter more readily. The real reason, however, for the use of some cheap neutral salt is to offset the strong affinity that the water has for the dye, but not to add such an amount of salt as will cause a precipitation or a "salting-out" of the dye from its solution. By adding a proper amount of salt to the dye-bath, a balance (equilibrium) is sought that equalizes the affinity of the water for the dye by lowering it to *or below* that of the material to be dyed at the determined temperature of dyeing; and which conversely, raises the dye absorption powers of the cotton.

All substantive dyes are not alike, the "coefficient of solubility" or the "constant" for their solution in water differs very much for individual dyes, a point generally lost sight

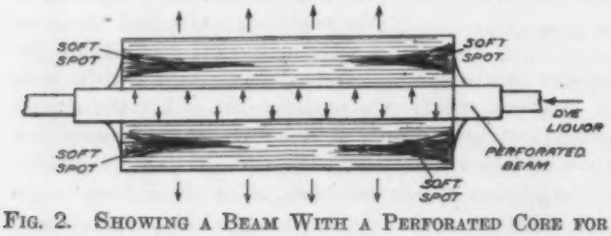



FIG. 2. SHOWING A BEAM WITH A PERFORATED CORE FOR THE DYE LIQUOR, THE SOFT SPOTS BEING INDICATED BY THE DARKER SHADING.

of when using mixtures of dyes, the components of which behave quite differently towards salt in solution, and which is the frequent cause of irregularities in dyeing. Dyeing results obtained from beam warp dyeing machines have been rejected for no other reason than that the selection of dyestuffs made use of was entirely unsuited for such work, while no fault could be found with the same dye when used on the same count of yarn in the open kettle.

Penetration with the sulphur colors, of hard twisted yarns when hard wound on beams is less difficult than with other classes of colors, because such dyes are always used when dissolved in strongly alkaline solutions, made so with sodium polysulphide and soda ash. Such a solution performs a double function; it keeps the dyestuff completely dissolved, without which there can be no satisfactory

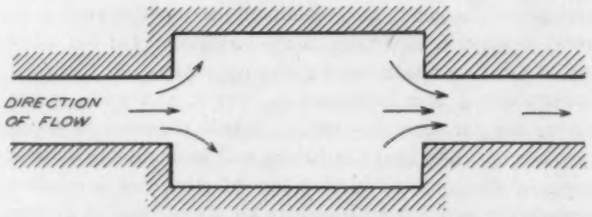



FIG. 3. WHY THE DYE LIQUOR TRAVELS SLOWER IN THE SOFT SPOTS.

dyeing result; and it also acts as a solvent for the oils and waxes natural to the cotton fiber, the presence of which, in the form of an outer protective coat on the individual fiber prevents the normal dyeing of the cotton.

As an aid in the proper dyeing of warp beams, the preliminary "wetting-out" is resorted to, by alternately forcing a weak alkaline solution through the beam, first in one direction, then in another. Or instead of an alkaline solution, one containing one of the common types of soluble oil is employed with good effect.

If the cotton in warp form is not absolutely clean and free from oil or waxes, penetration of the fiber with color is not possible, and the complete removal of such substances is again governed by the density of the beam and its uniformity, that is, the freedom from "soft spots," and the time allowed for the solvents to do their work before the rinse. Reference to the previous illustrations will make clear this point.

### UNEVEN DYEING RESULTS.

So many causes have been blamed for uneven results in dyed beams, that it is with extreme difficulty that any one can be selected as the "one" cardinal cause. Besides the inequalities due to imperfect beaming, which, in time, may be traced to defective winding, we have in reality but little, from a mechanical point of view, to blame for dyeing imperfections, except, possibly, defective preparation.

In dyeing large beams in closed apparatus operated under pressure, due regard must be given to certain conditions that are likely to inject themselves without warning, and often without exciting observation. For instance, the operation of the circulating pump may slow down somewhat, and consequently the normal volume of liquor per minute may not pass through the entire mass of warp. Owing to this reduced pressure, annular soft areas in the body of the warp may serve as ready outlets for the dye liquor under diminished pressure, and consequently, such areas will become somewhat more heavily colored than the other areas, as in Fig. 4.

Comparing the radial flow of the dye liquor, in the direction as shown in the accompanying sketch, Fig. 5, the following points are to be noted. In diagram A, the flow of the liquor is from the outside to the inside; the mass of cotton through which it must pass is less as it approaches the center and the rate of flow (volume per min-

(*Continued on page 131.*)

# The New Orleans Cotton Warehouses

BY FRANK J. TRELEASE, OF FORD, BACON AND DAVIS, NEW ORLEANS, LA.

The Board of Commissioners of the port of New Orleans is completing a public cotton warehouse and terminal plant which has an annual capacity of two million bales. Some work remains to be done on the wharf house, but the balance of the plant is complete and has been in operation since the beginning of the season.

The plant is located on the east bank of the Mississippi river near the heart of New Orleans. The site, which consists of nearly 150 acres of land, is largely a reclaimed batture or flat between the normal bank of the river and the levee. This batture was subject to overflow but was reclaimed by filling in with sand dredged from the river. The fill has been sufficiently extended beyond the original bank of the river to insure a 30-foot channel at the face of the wharf even during low water.

The main buildings comprising the plant are: a compress building, a power house, four large warehouses and an immense two-story wharf house. A three-story office building near the middle of the plant provides accommodation for the manager and his forces. All of the buildings are connected by two-story runways or bridges upon which the cotton is transported from place to place. The general arrangement of the building is as shown in Fig. 1, which also gives their general dimensions and capacities. Cross sections through the plant, from the tracks on the city side to the apron wharf at the river, are shown in Fig. 2.

### TERMINAL FACILITIES.

All railroads entering New Orleans have connections with the New Orleans public belt railway. The belt railway enters the cotton warehouse property on the city side at both ends, serving 22 miles of track in the receiving, sorting and operating yards which have a capacity of about 2,000 cars. If one-half of the track in the yard is available for loaded cars it will allow an accumulation of 1,000 cars or about 30,000 to 40,000 bales, serving as a reservoir to equalize the number of bales required to be handled daily by the warehouse force. Receiving and delivery tracks with a capacity of about 200 cars, or 6,000 to 7,000 bales, are provided alongside the warehouse and on the apron wharf.

The wharf on the south side of the property provides facilities for loading and unloading ocean going ships and river boats, and is of such length that four large steamers may be handled at once. The large size of the wharf house enables it to serve as a storage reservoir to equalize the loading or unloading, and, since each section will hold practically an entire cargo, makes possible very rapid handling of the cotton while the vessel is berthed.

A small amount of cotton is handled locally to and from the warehouses by motor trucks. Paved motor roadways are provided enabling the trucks to drive directly into the compress building and along the warehouse platforms.

### DESIGN AND CONSTRUCTION.

All of the buildings are of permanent and fireproof construction. They rest on creosoted piles from 30 to 50 feet long loaded from 10 to 12 tons apiece. The buildings themselves are of reinforced concrete and present excellent examples of that type of construction.

The compress building is a one-story structure about 230 feet wide and 410 feet long, with a 22-foot story height. It has a covered receiving platform 8 feet wide on the north side, while along the south side is a receiving and handling platform 35 feet wide connecting with the first story runways leading to the other buildings. Over this platform is another at the level of the overhead runways, and connecting with them. Provision has been made for placing cotton on trucks on this second story platform directly from the presses. The entire north and south sides of the building are composed of steel rolling doors between the concrete columns, so that direct entry to the building may be had from any and all points on the platform. The building is paved with concrete in those places where trucking is to be expected, and with shells over the rest of the floor. The roof is of the saw-tooth type, and is of reinforced concrete fitted with steel sash glazed with wire glass. A row of large windows is provided in the north wall of the building, and these also are fitted with steel sash glazed with wire glass. These windows and those in the saw-tooth roof afford excellent lighting, as may be seen by inspection of Fig. 3, which is a photograph of the interior of the compress building.

The warehouses proper are of unique design. Before determining their type an exhaustive study was made of warehouses both in this country and abroad, and of the methods of handling and storing the cotton. The method of storage to be used determines largely the type of warehouse to be built. Thus if the bales are to be spread out or stored on end one bale high, a low single story warehouse or a multiple story building with low story heights would be required. If, on the other hand, the cotton is to be piled in tiers several bales high, the logical type of building is the single story warehouse. The single story warehouse provides far greater storage capacity per dollar invested than a multiple story building, largely because the load rests directly upon the ground and need not be supported upon expensive construction. The single story building also affords excellent opportunity for the installation and operation of mechanical handling devices, and the design of this type of building is much simpler than that of a multiple story warehouse. Careful consideration of the many features involved led to the selection, for the New Orleans project, of the single story warehouse in which the cotton is to be stored in tiers ten or more bales high.

Two of the warehouses as built are each 203 feet wide and 420 feet long and two are of the same width but each 580 feet long. A two-story covered platform is provided along each side, except that on the city side adjacent to the railroad yards the second story platform has been omitted for the present. The first floor platforms are 35 feet wide and the upper floor 25, affording ample room for ranging and sampling cotton as well as for trucking. The platforms connect directly with the runways leading from building to building.

The warehouses are divided into compartments each 32 feet wide and a little over 100 feet long with a clear story height of about 36 feet. The walls forming the compartments are of reinforced concrete twelve inches thick and form effective fire stops. Near the tops of the walls are reinforced concrete crane shelves upon which are bolted the steel rails carrying the traveling cranes used for handling the cotton.

Steel crane girders extend out from each compartment over the platforms so that the cotton may be handled by the cranes from either level directly into the warehouse or vice versa. Great care was taken in the design of the walls because of their unusual height and the severe strains to which they are subjected by the high speed cranes and by the piles of cotton. All of the exterior walls and exposed portions of the warehouses and other buildings were designed to resist a heavy wind pressure, and it is a notable fact that in the recent storm, which struck the plant with the full fury of the wind exceeding 120 miles per hour, absolutely no damage was done to any of the structures.

The warehouses are paved with concrete near the doors where trucking will be done and with shell at other places. Low wooden skids or platforms have been provided on the floors to receive the cotton, although experiments have shown that the cotton is not injured or affected in any way if placed directly on the shell floor.

The warehouses are lighted through large doors and also by ample skylights in the roof. Ventilation is provided through screened louvres embodied in the skylights.

Two large doors have been provided for each compartment at the floor level to provide access from the first floor platform and the door at the top the full width of the compartment, to pass the cranes. All door openings are equipped with rolling fire doors of galvanized steel. Fig. 4 is a photograph of the interior of one of the 124 warehouse compartments, which gives a good idea of the construction, and the manner of storing the cotton. Fig. 5 is a photograph of the lower or receiving platform on the city side of one of the warehouses.

The power house is a two-story building 75 feet wide and 96 feet long, and houses the boilers supplying the presses, and also contains a motor generator room, a truck garage, and the truck and crane repair shops. It is of reinforced concrete construction with steel rolling doors and windows of wire glass in steel sash. The boiler room contains three horizontal return tubular boilers of 200 horsepower each, with space for a fourth. A coal bunker and ashpit are served by a traveling crane which operates on girders extending through the boiler room and out over the tracks on each side.

In the motor generator room is installed the machinery required to convert the current for the operation of the cranes throughout the plant and for charging truck batteries. A small crane is provided for any necessary handling of this machinery.

The truck garage on the second floor of the building is fully equipped as a charging station, with proper racks for the batteries and a small crane for handling them. Adjoining the garage and on the same floor, is a machine shop and also a crane repair shop with runways upon which any of the cotton handling cranes may be placed for overhauling.

The wharf house is a two-story building 122 feet wide and 1,513 feet long. Both stories are reached by runways connecting with the other buildings, and inclined elevators are provided to transfer trucks and trailer trains from one floor to the other. Along the shore side is a 15-foot covered receiving and handling platform and on the river side a 45-foot timber apron wharf. This apron wharf is paved with creosoted blocks and carries two railroad tracks and the rail for the wharf cranes.

The second story of the wharf house is about 20 feet less width than the first story, providing a platform on the river side from which cotton may be handled by the wharf cranes directly to the hold of a ship. The building is divided by fire walls into sections about 250 feet long.

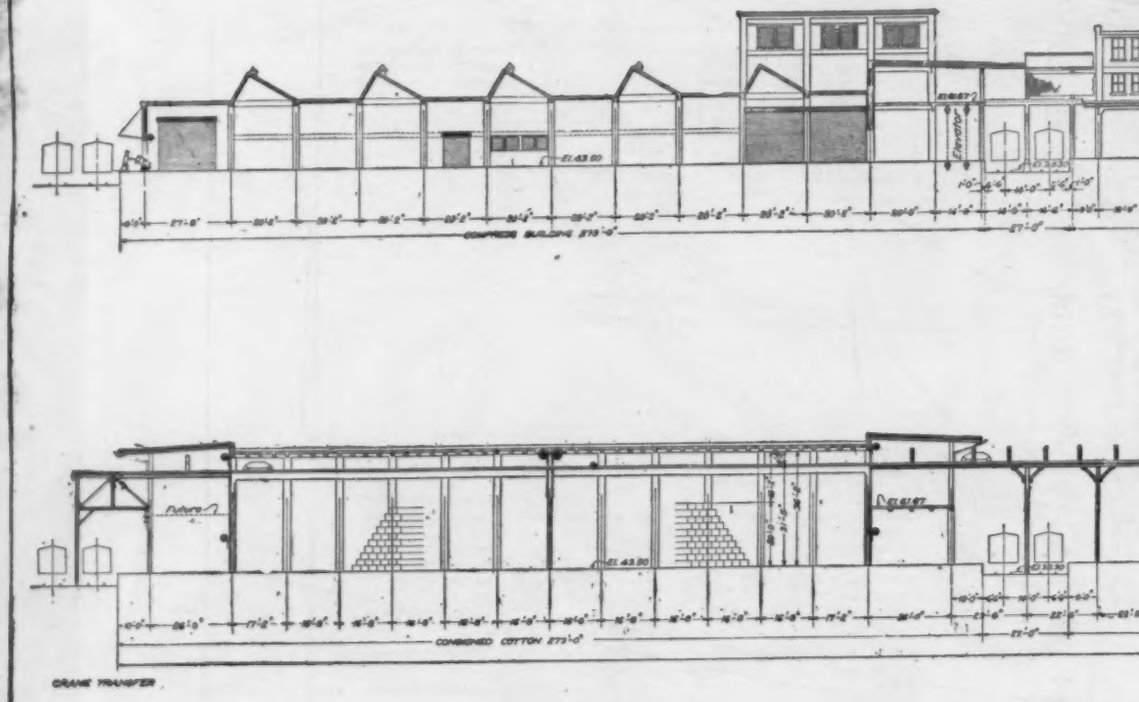
The wharf house is of reinforced concrete resting on a specially designed wooden pile foundation. Galvanized steel rolling doors are used throughout and all windows are of steel sash glazed with wire glass. The floors and roof are of what is known as the flat slab type of construction, providing an exceptionally strong and resilient structure and occupying very little headroom.

The first floor is designed for a safe live load of 350 pounds per square foot, the second floor 200 pounds, and the roof 30. These floor loads are more than will be realized with cotton, but are ample to take care of general merchandise should it be desired to use the wharf for such purposes in summer months, when comparatively little cotton is shipped.

All of the buildings are connected by a system of two-story runways. The lower level is at the ground and is merely a concrete-paved roadway with lift bridges at the railroad tracks. The upper level consists of a reinforced concrete bridge covered by a continuous corrugated iron housing supported on a structural steel frame work. Along the warehouses the upper runway is about 25 feet wide, and between buildings it is about 16 feet wide. Inclined elevators to transfer trucks and trailer trains from one level to the other are provided at intervals. The upper level of the runways provides an unobstructible roadway for the trucks and will be used to handle the normal traffic. The lower runways are available for overflow trucking during periods of unusual activity, but traffic on them of course is subject to occasional interruption at the draw bridges over the tracks. The arrangement of the runways permits of both double track operation and loop routing in which the trucks move continuously forward from their starting point until they return to the same point.

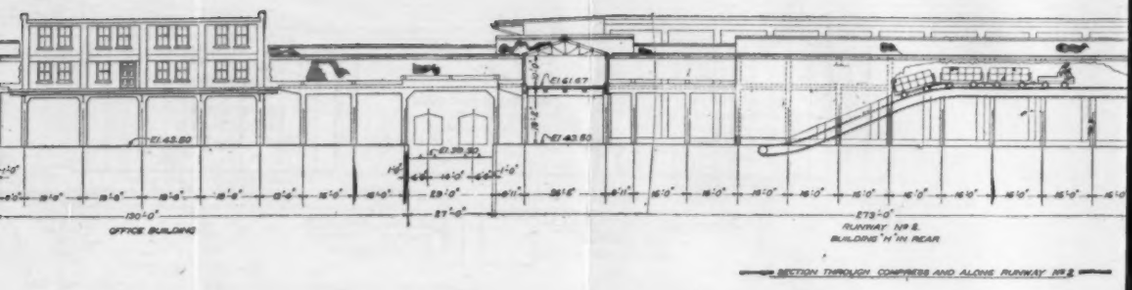
### FIRE PROTECTION.

All of the structures comprising the plant are of the most modern type of fireproof construction. Additional protection against fire is provided by large spaces separating the several structures. All of the buildings are fully equipped with sprinklers. Auxiliary high pressure fire pumps are installed in submerged chambers under the wharf house, and are arranged to operate automatically in case of fire, should the city water supply prove inadequate to maintain the proper pressure on the sprinkler system. In addition monitors, capable of throwing a large stream over a wide area have been provided at the corner of each building, and hose houses, containing standard fire hydrants and equipment, are provided at intervals over the entire plant. Small hand extinguishers are located at convenient places in all the buildings. A large number of watchmen

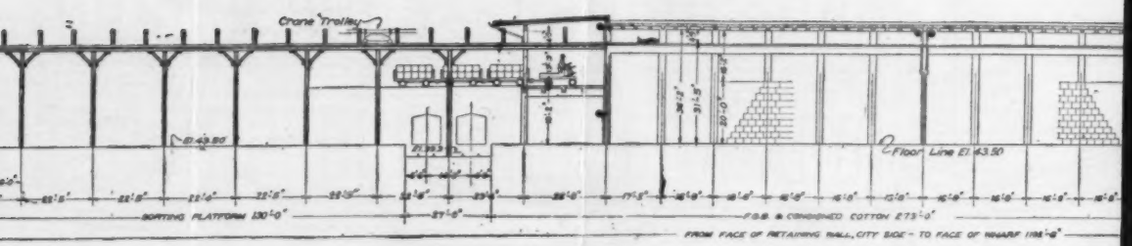




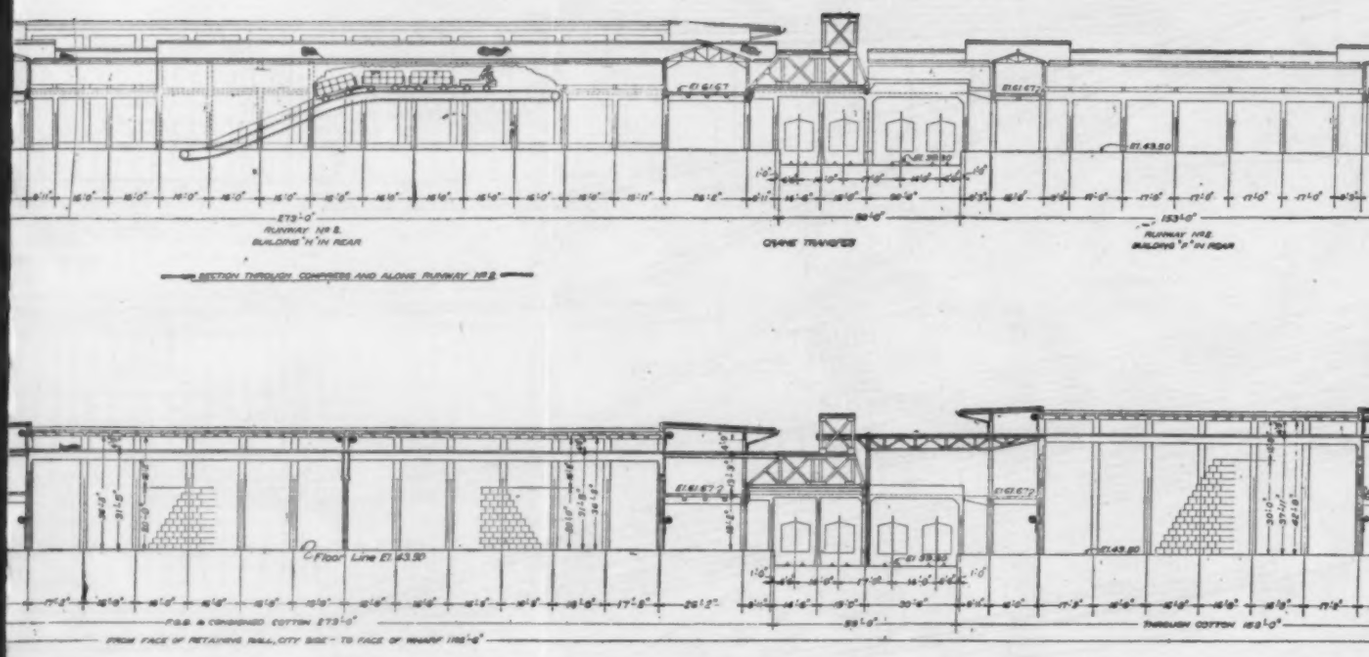
CRANE TRANSFER



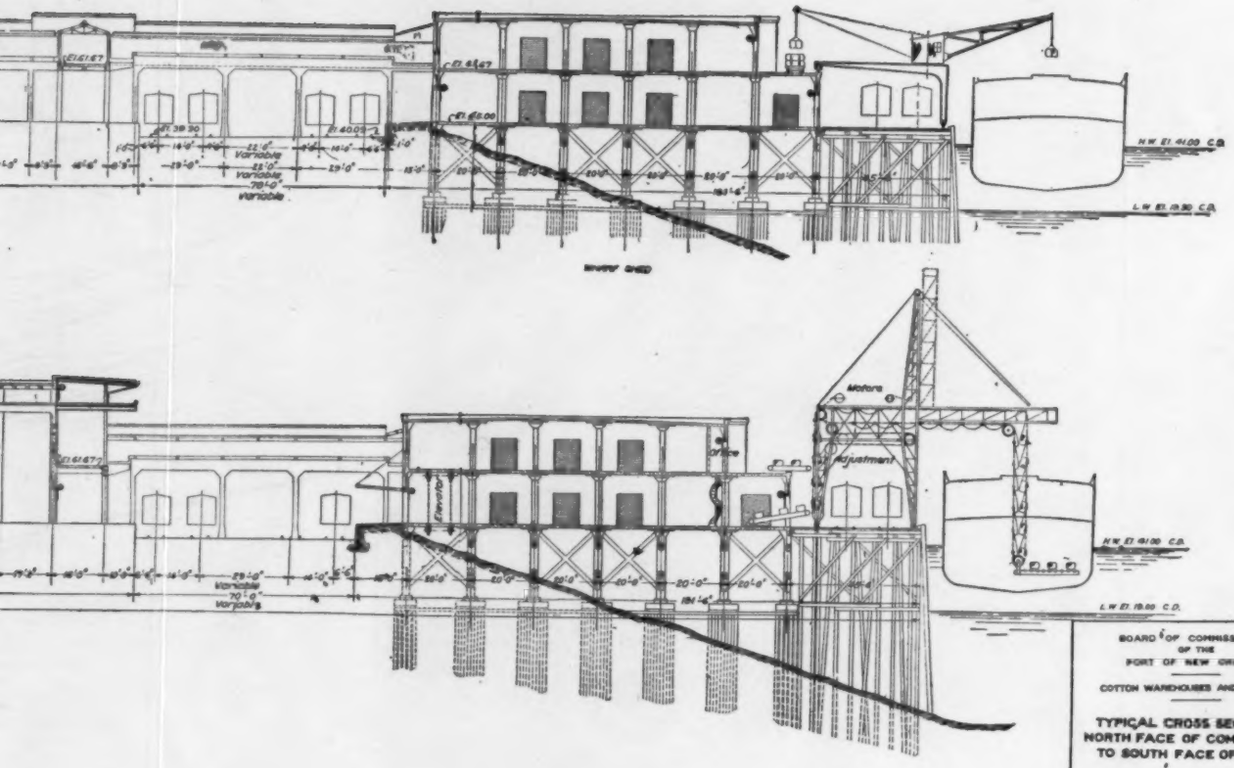

SECTION THROUGH COMPRESS AND ALONG RUNWAY Nº 8


Crane Trolley
El 43.50
Floor Line El 43.50
SORTING PLATFORM 130'-0"
87'-0"
F.O.B. & CONSIGNED COTTON E 73'-0"
FROM FACE OF RETAINING WALL, CITY SIDE - TO FACE OF WHARF 118'-6"

SECTION THROUGH BUILDING 'K' SORTING PLATFORM, BUILDINGS 'H' AND 'F' WHARF HOUSE AND WHARF


SECTION THROUGH CONVEYERS AND ALONG RUNWAY NO 2
SECTION THROUGH BUILDING "A" SORTING PLATFORM
BUILDINGS "A" AND "F" WHARF HOUSE AND WHARF

Supplement to COTTON, January, 1916. FIG. 2. A CROSS SECTION THROUGH THE PLANT.







BOARD OF COMMISSIONERS
OF THE
PORT OF NEW ORLEANS

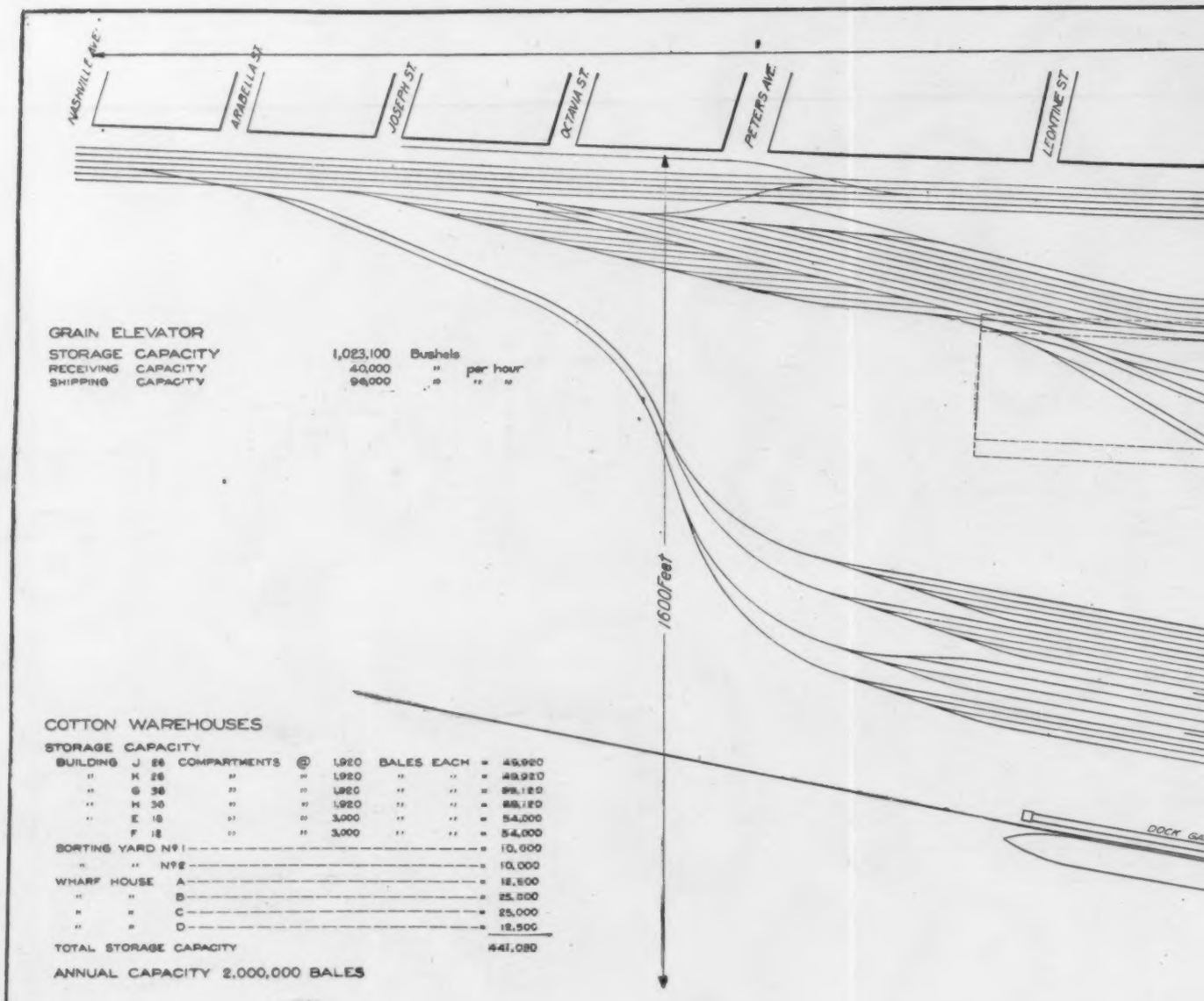
COTTON WAREHOUSES AND TERMINAL

**TYPICAL CROSS SECTIONS**
**NORTH FACE OF COMPRESS BLD. TO SOUTH FACE OF WHARF**

FORD, BACON & DAVIS — NEW ORLEANS, JAN. 21, 1918

SCALE 1/8" = 1'-0"

N.O. 6311-S.




GRAIN ELEVATOR

| | | | |
|---|---|---|---|
| STORAGE CAPACITY | 1,023,100 | Bushels | |
| RECEIVING CAPACITY | 40,000 | " | per hour |
| SHIPPING CAPACITY | 96,000 | " | " " |

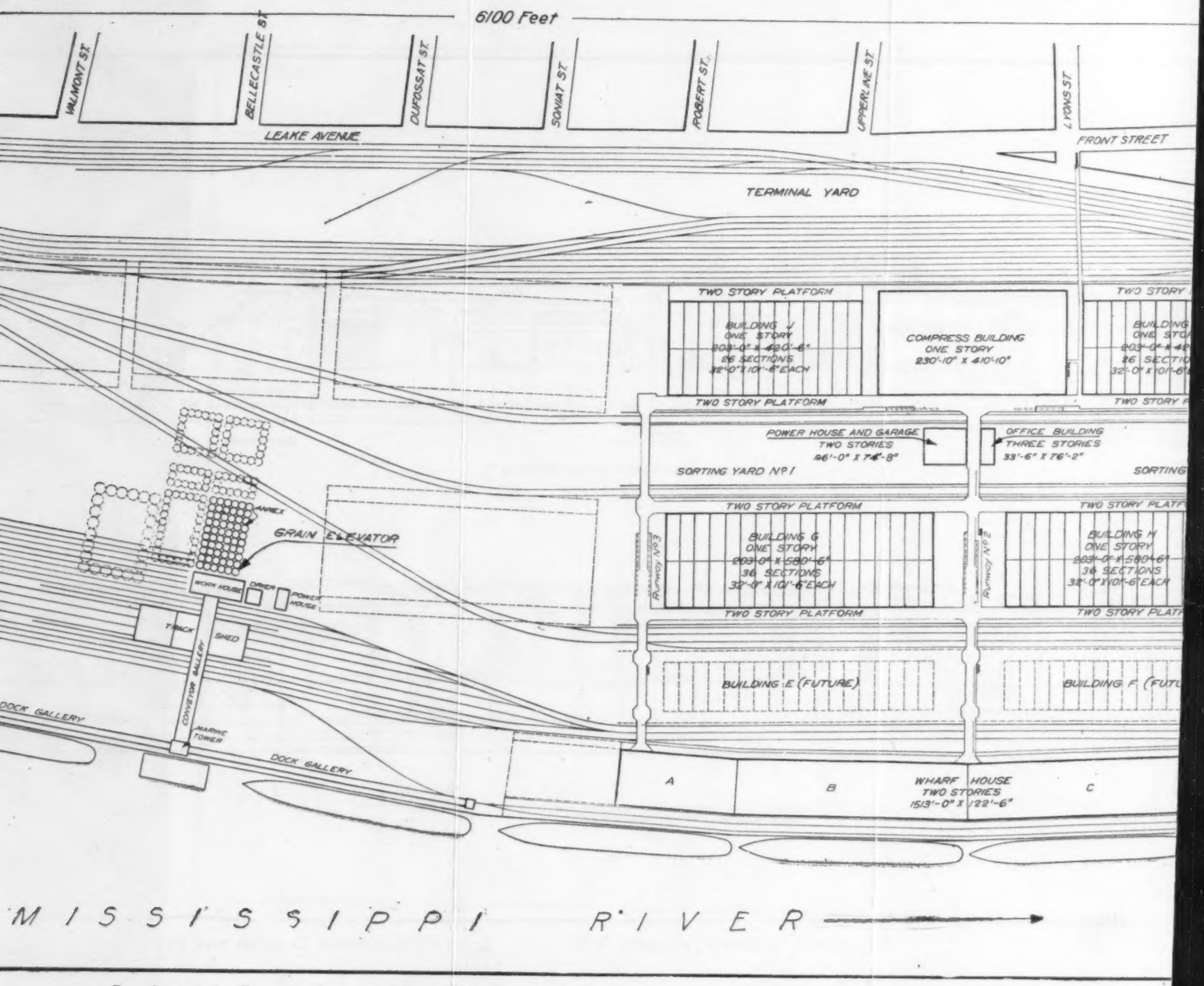
COTTON WAREHOUSES

STORAGE CAPACITY

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| BUILDING | J | 26 | COMPARTMENTS @ | 1,920 | BALES EACH | = | 49,920 |
| " | K | 26 | " " | 1,920 | " " | = | 49,920 |
| " | G | 38 | " " | 1,920 | " " | = | 73,120 |
| " | H | 38 | " " | 1,920 | " " | = | 73,120 |
| " | E | 18 | " " | 3,000 | " " | = | 54,000 |
| | F | 18 | " " | 3,000 | " " | = | 54,000 |
| SORTING YARD Nº 1 | | | | | | = | 10,000 |
| " " Nº 2 | | | | | | = | 10,000 |
| WHARF HOUSE | | A | | | | = | 12,500 |
| " " | | B | | | | = | 25,000 |
| " " | | C | | | | = | 25,000 |
| " " | | D | | | | = | 12,500 |
| TOTAL STORAGE CAPACITY | | | | | | | 441,080 |

ANNUAL CAPACITY 2,000,000 BALES

M




Supplement to COTTON, January, 1916. FIG. 1. PLAN SHOWING GENERAL ARRANGEMENT OF THE ENTIRE PLANT.

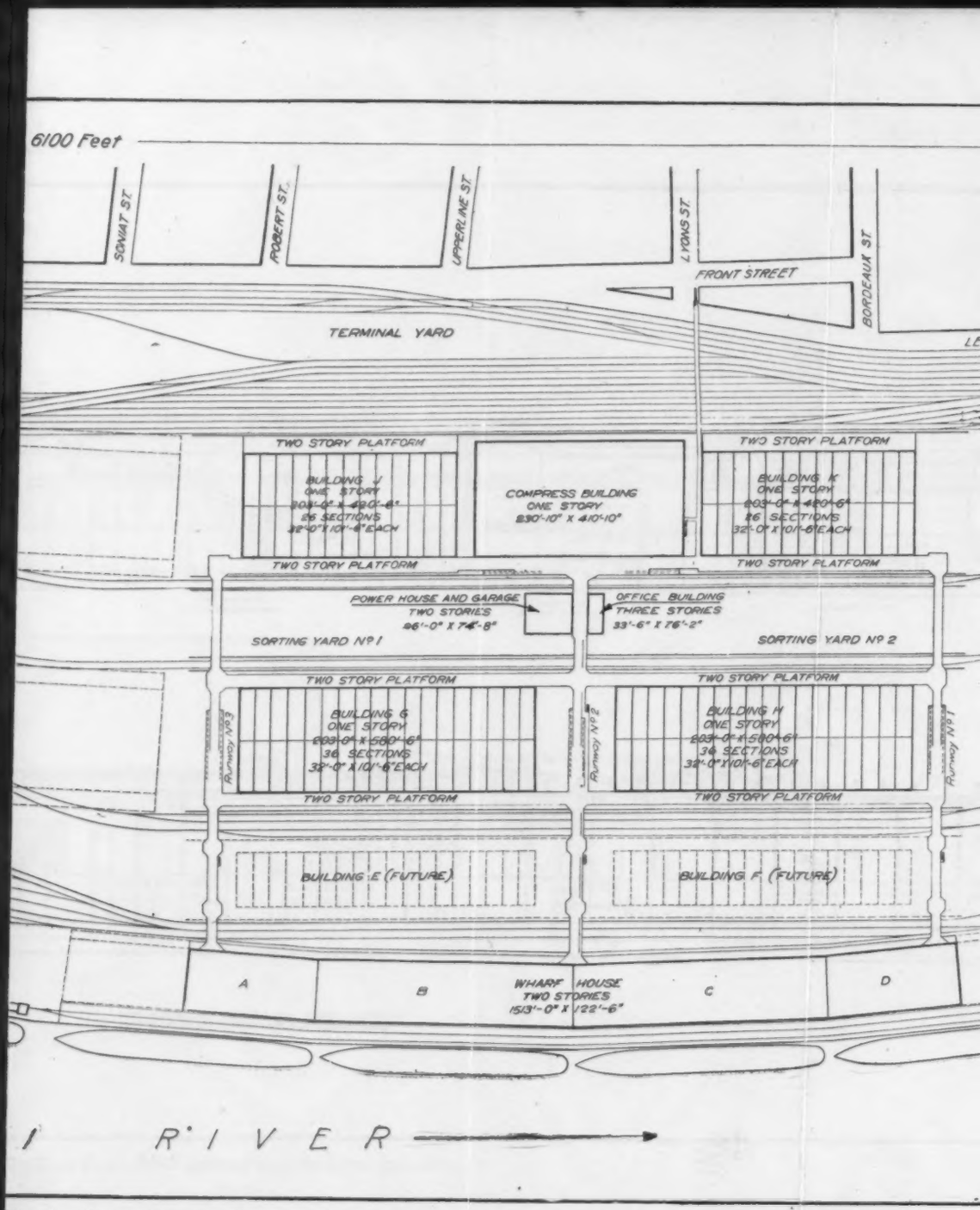
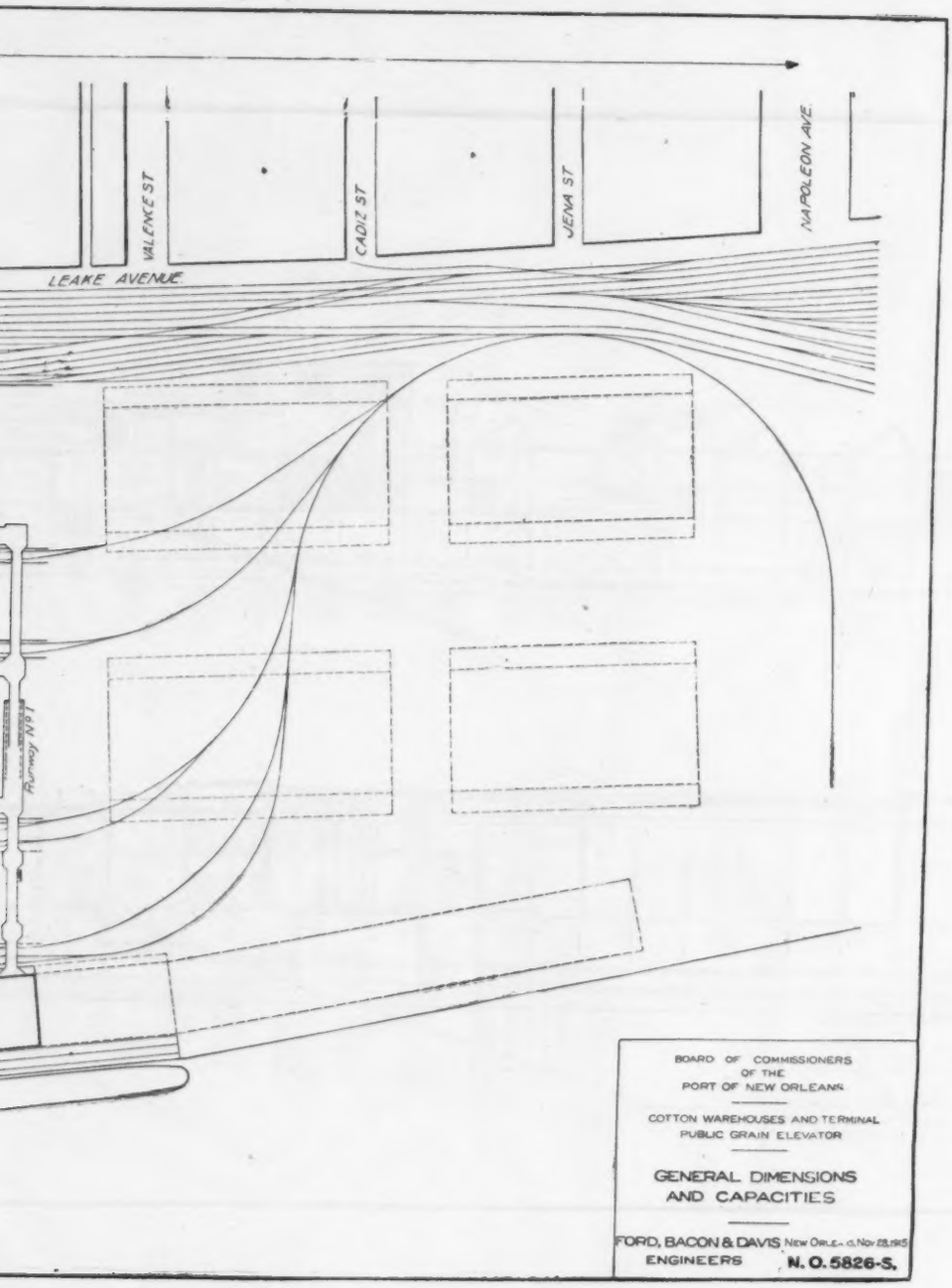



FIG. 1. PLAN SHOWING GENERAL ARRANGEMENT OF THE ENTIRE PLANT.




BOARD OF COMMISSIONERS
OF THE
PORT OF NEW ORLEANS

COTTON WAREHOUSES AND TERMINAL
PUBLIC GRAIN ELEVATOR

# GENERAL DIMENSIONS AND CAPACITIES

FORD, BACON & DAVIS, New Orleans, Nov 23, 1915
ENGINEERS N. O. 5826-S.

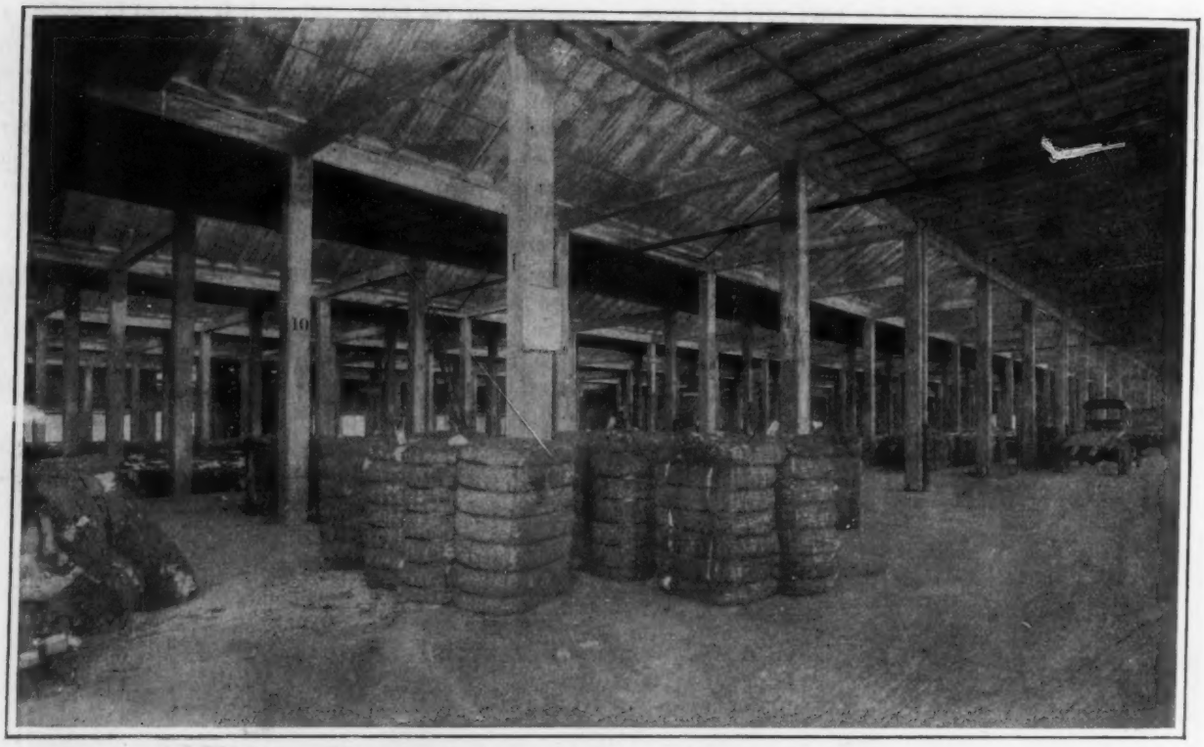


FIG. 3. THE INTERIOR OF TNE COMPRESS BUILDING.

are on duty at all times day and night. In general, every precaution has been observed, and as a result it has been possible to obtain an extremely low rate of insurance.

MECHANICAL EQUIPMENT.

The compress building contains three steam presses and one hydraulic press. The steam presses are all of the usual Morse type, one 90-inch, one 86-inch and one 84-inch.

The hydraulic press is of the type known as the "Standard Compress" and is of 450 tons capacity. It is operated by water at a pressure of 2,000 pounds per square inch, which is supplied by electrically driven pumps located in a small structure adjoining the power house. This type of press is equipped with side and end doors which confine the cotton while being compressed, so that all bales are turned out two feet square and four feet long.

Hand trucks are used to some extent in the immediate

FIG. 4. THE INTERIOR OF ONE OF THE WAREHOUSE COMPARTMENTS.

vicinity of the compresses, but for the most part the cotton is handled from place to place in the plant on small self-propelled storage battery trucks. Each truck is capable of handling 8 bales of cotton, and is controlled by one man who rides on it. The trucks are 12 feet long, 23 inches high, and travel at a speed of 6 to 8 miles per hour. The batteries are of such size as to require charging but once a day. Charging stations are located at several points about the plant as well as in the truck garage.

It is proposed to employ electric tractors with trailer trains for the transportation of cotton from one warehouse to another and from the warehouses to the wharf. Each tractor will draw three trailers holding ten bales of cotton each. These trains are to be operate on the overhead runways and will travel at a speed of six to eight miles per hour.

A number of gasoline motor trucks, with special bodies to carry 17 bales of cotton, have been provided for collecting and delivering small lots of cotton about the city. A light delivery auto is used to take samples from the plant to the owners of the cotton and to the Cotton Exchange where duplicate samples are filed for comparison with the owner's sample when the bale is sold.

FIG. 5. THE LOWER OR RECEIVING PLATFORM AT THE WAREHOUSES.

TRAVELING CRANES.

Cotton is handled in the warehouse compartments by high speed electric traveling cranes which serve every square foot of the area of each compartment. The cranes are operated by one man who rides in a cab attached to the trolley, having at all times a good view of the cotton which he is handling. By the use of an automatic grapple, this same operator can pick up cotton from the platforms or from trucks, and place it at any desired point in the compartment, or can load it on a trailer for transportation to the wharf. Ordinary hooks are also used to some extent instead of the grapples, but require an additional man to place them on the bales. Where it is desired to remove a bale of cotton from the pile, a specially designed bale puller is used in connection with the crane. This requires the help of only one man in addition to the crane operator, but will remove any desired bale from a tier any number of bales high in less than three minutes. The cranes can be transferred from one compartment to another on transfer tables, thus avoiding the necessity of supplying a separate crane for each.

The cranes are of the three motor type and are rated at two tons capacity. They operate on 220-volt direct current supplied by the motor generator in the power house. The hoisting motor is rated at 20 horsepower and raises the load at the rate of 150 feet per minute. The bridge is moved at a speed of 500 feet per minute by a ten horsepower motor and the trolley 150 feet per minute by a two horsepower motor.

The automatic cotton grapples used in connection with the cranes are of simple design and construction. The entire grapple is only 18 inches wide, four feet long, and about 18 inches high. It is suspended from the crane and entirely controlled by the crane operator, enabling him to perform alone, the entire operation of moving, hoisting, lowering and stacking the bales. The grapple consists essentially of four curved spikes or tines pivoted in a light steel framework, which supports a small motor to drive them into the bale and to remove them. The motor operates the tines through a worm gear and a system of links and bell crank levers. After the operator in the crane cab has lowered the grapple on the bale he closes a switch controlling the motor which then rotates until it has driven the tines finally into place, at which point it is automatically stopped. After the bale has been transferred to the desired place, the switch in the cab is thrown to the reverse position, causing the motor to rotate in the opposite direc-

tion and to withdraw the tines from the bale. The grapple is very rapid in operation, and one crane operator can handle with it from 75 to 125 bales per hour, picking them up from the warehouse platform and depositing them in the pile in the compartment. Figs. 6 and 7 are photographs of the grapple.

The rapid removal of any desired bale from a pile is of importance when cotton is stored in tiers. Ordinarily it

FIG. 6. THE GRAPPLE ABOVE THE BALE OF COTTON.

has been necessary to lift off all bales above the one desired before it could be removed, but for the New Orleans plant a special device has been developed which makes that unnecessary. This is the bale puller, which is operated in connection with the traveling cranes. It is a light structural steel A frame about five feet long, which is supported from the crane. At the front are two projecting arms, which are forced by a man into the space between the bale to be removed and those directly over it. When a strain is exerted by the crane these arms tend to lift up on the bales

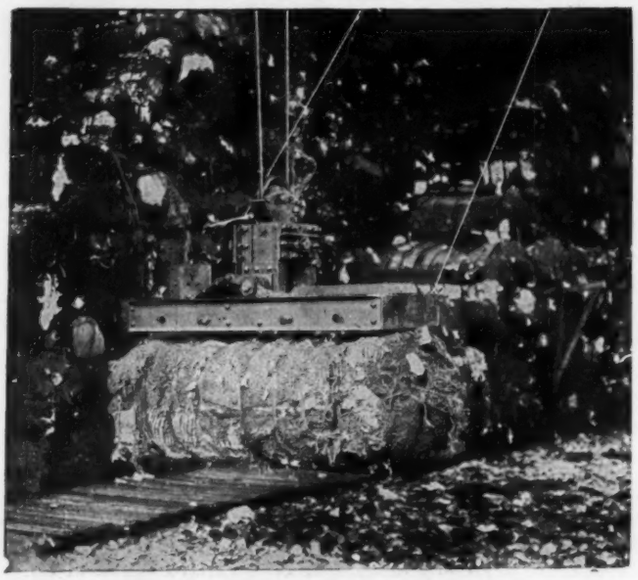


FIG. 7. THE GRAPPLE HOLDING THE BALE.

under which they rest, thus reducing the friction on the bale to be pulled. The framework has a sheave near the front and one at the extreme end, and over these is passed the hoisting cable from the crane. The end of this cable is attached by means of a yoke and pins to two hooks, which are inserted at the sides of the bale to be pulled and turned to engage it at its inner end. When a strain is exerted by the crane on this cable, it causes the framework of the puller to press firmly against the bales over the one to be removed and also to lift them from the bale desired, which is then drawn out by the hooks attached to it. When a bale is removed from a pile, the bales settle down without disturbing the relation of the individual bales in the stack. Figs. 8 and 9 are photographs of the bale puller.

The wharf is to be provided with single leg gantry cranes. These are to be two-ton cranes of the three motor type, with a luffing or derricking boom, giving a maximum radius of 50 feet. The cranes will cover the apron wharf with its two railroad tracks as well as the wharf house platform, and will take cotton from any of these places and lower it directly into the hold of a ship. They can of course, also be used for unloading cotton from the vessels and placing it on the wharf or platform, or in cars.

The Board of Commissioners of the port of New Orleans is composed of Ernest M. Loeb, president; Charles D. O'Connor, vice-president; William O. Hudson, secretary;

FIG. 8. THE BALE PULLER IN POSITION.

Jefferson D. Hardin, commissioner of finance; Tiley S. McChesney, treasurer, and James Wilkinson, attorney.

The success of the project is largely due to their far sightedness and to the cooperation of the various associated committees of the Cotton Exchange and others interested in the development of the cotton warehouses and terminal. In preparing plans and specifications, the engineers have been assisted by the special committee of the Cotton Exchange on public warehouses, composed of the following members: W. P. Stewart, chairman; John F. Clarke, W. H. Chaffe, Jos. A. Airey and S. Waltern Stern. E. J. Glenny, as president of the exchange, has attended all the conferences of the Dock Board, its engineers and the Cotton Exchange committee, while the membership of the Cotton Exchange in general has rendered every assistance

possible. Col. H. G. Hester, secretary of the Cotton Exchange, has furnished general data and statistics of the cotton production and marketing, particularly the detailed data relating to the cotton business of New Orleans.

Ford, Bacon & Davis, of New Orleans, New York and San Francisco, acting as consulting engineers for the Board of Port Commssioners, prepared a comprehensive report on cotton warehouse design and construction, based upon a very thorough study of port facilities both in this country and abroad. They also have prepared the detail plans

FIG 9. THE BALE OF COTTON AFTER EXTRACTION.

and specifications for the cotton warehouse and terminal as erected, and have supervised the construction.

Construction is covered by contracts with the following companies and firms: Lousiana Contracting Co., New Orleans and Baton Rouge, dredging and filling; Jefferson Construction Co., New Orleans, compress and warehouse buildings; Jacob A. Zimmerman & Son, Inc., New Orleans and New York, wharf house; Doullut & Williams, New Orleans, apron wharf and approach; fire protection (sprinkler system, etc.), General Fire Extinguisher Co., New Orleans; steel doors, Kinnear Mfg. Co., Columbus, Ohio; electric traveling cranes, Pawling and Harnischfeger Co., Milwaukee; electrical apparatus, Allis-Chalmers Mfg. Co.; electrical distribution, Marks Electrical Cons. Co., New Orleans.

## New Electrical Contracting Firm.

R. S. Huntington, electrical contractor, and DuPont Guerry, Jr., formerly in the electrical department of J. E. Sirrine, mill engineer, beg to announce that they have entered into partnership for electrical engineering contracting, and will specialize in textile mill and power plant installations. They have offices in the Masonic Temple, Greenville, South Carolina. The new firm will be known as Huntington & Guerry. While the individual members of this firm are competent electrical engineers, they are specializing on the contracting, rather than the engineering section of the business field.

## On the Eve of Prosperity.

*(Continued from page 95)*

tinue to produce in abundance all the crops, which are necessary for the maintenance of our people and the extension of our commerce abroad.

We have every reason to be optimistic; we have every reason to take courage; we have no good reason for a feeling of depression. We have the surest ground for confidence. When we consider that this, our country, has such gigantic resources, and is backed by such a vast storehouse of natural wealth, I do not feel that we should worry about our material and financial future. When we couple these vast resources and opportunities with the spirit of a people of industry, enterprise, and determination, no deterrent influence in other parts of the world can stop the onward march of our commercial growth toward international supremacy. We of the South rejoice to see the evidences of growth, progress, and industry, throughout this favored section, but we extend to all other sections of this country the right hand of good fellowship, and we are proud to say that we are a part of a great nation, which has a great mission among the peoples of the world. Actuated by the highest ideals of altruism, we have naught to do but attend to our own business, and we will insure to ourselves and our children the peace, prosperity, and happiness, which is the reward of faithful effort.

## Operates Leased Phone to Eleven Mines.

The Southern Coal & Coke Company has not only built up a great business by mining high grade coal, shipping in excess of one million tons annually, but also by making a specialty of prompt service. Every car of coal that is shipped by this company is traced to destination. If any customer writes or wires the Southern as to the whereabouts of any car shipped, this car can be located almost instantly. In the Northwest, to which the Southern ships several hundred cars of high grade domestic coal monthly, they advise consignees of the movement of every car, advising them by mail whenever a car passes a junction point, going from one railroad system to another. Another feature of the unusual service of this company is the manner in which it handles orders daily. Every day, all orders are assembled at the main offices in Knoxville, and by leased telephone wire, their eleven mines are notified of the most urgent cases requiring shipment. This close attention to orders and shipments has won the Southern many fast friends among steam and domestic users, and almost daily it receives a letter commending its service.

## Secures a Million Dollar Order.

As one more proof of the wonderful business prospects of 1916, it is well to consider the business reported by Samuel Austin & Son Co., industrial engineers and builders, with offices at Cleveland, Ohio. In one week they received orders for factory buildings and equipment for the General Electric Co., Schnectady, N. Y.; the A. P. W. Paper Co. at Albany and the Hooker Electro Chemical Co. at Niagara Falls, totaling more than $1,250,000.

# The Influence and Application of Humidity in the Processing of Cotton

BY STANLEY H. HART.

The question of humidity or moisture is a factor that is given insufficient attention in many cotton yarn mills. Much attention is given to the care of the various machines, the grade of cotton and the efficiency of the help, while comparatively little thought is given to the all important question of humidity, when by neglect of the latter it is possible to destroy all the advantages gained by the other factors mentioned.

When cotton spinning was in its infancy, it was discovered that the best results were obtained in warm, and at the same time, humid or moist atmosphere. These two factors are most important in producing a smooth, elastic and strong yarn. The cotton fibre has the valuable property of absorbing moisture and by so doing, becomes less brittle, more pliable and supple, and better adapted to form a perfect thread. Cotton when cold and dry has a harsh feel. The normal amount of moisture in either loose cotton or yarn is 7½ per cent.

Warm temperatures melt the natural wax coating of the cotton fibres, thereby allowing them to work properly. The best results are obtained between the temperatures of 70 and 85 degrees F. in this country with the proper percentage of relative humidity varying with the various degrees of temperature and the process. Temperatures higher than 85 degrees F. are often used in mills on fine counts and good results are obtained if the relative humidity is right. One objection to high temperatures is the difficulty of obtaining the proper relative humidity, and another objection is the impairment of the efficiency of the operatives by too high a temperature.

The term "relative humidity" has now been used several times. The meaning of this term is usually rather vague. The underlying principles of humidity are rather complicated in a way it is true, but they should be understood by all cotton mill men holding positions of responsibility. *Relative humidity* is a certain percentage of the total amount of moisture that the air is able to hold at a given temperature. For example, at a temperature of 75 degrees Fahrenheit it is desired to have a relative humidity of 80 per cent in the weave room. At 75 degrees Fahrenheit the air is only capable of holding per cubic foot 9.39 grains of moisture or water. To have a relative humidity of 80 per cent, every cubic foot of air should contain 80 per cent of the 9.39 grains or 7.51 grains of moisture. This 7.51 grains of moisture per cubic foot of air which we will consider has been found present is known as the actual moisture. When the saturation point is reached, the air will hold no more water as a vapor, but condenses it, and precipitates it as dew. At varying temperatures air is able to contain varying amounts of moisture. The higher the temperature, the greater the amounts of moisture capable of being held. The following is an example: At 32 degrees F. a cubic foot of air is capable of holding two grains of moisture or aqueous vapor, while at 100 degrees F. a cubic foot of air will be saturated with 20 grains of moisture or 10 times as much. It will be noticed that the amount capable of being held per cubic foot has increased tenfold while the temperature was tripled.

A practical illustration is shown in the following case. The temperature of a spinning room has been 75 degrees for several hours, and is suddenly raised to 90 degrees. The actual amount of moisture in the room is the same at both temperatures, but the relation of the moisture or humidity to the temperature has undergone a radical change as the amount of moisture capable of being held is much greater at 90 degrees than at 75. This illustration shows how the relative humidity will change in a room with any change of temperature. It is necessary to supply a large part of this humidity artificially and this part if the question will be considered in detail later.

Lancashire, England, has the most favorable climatic conditions of any locality spinning cotton. Its climate, together with other advantages such as close proximity to a cheap coal supply, transportation and an abundance of labor, have made it the greatest cotton spinning center in the world. In the United States, New Bedford's climate closely resembles that of Lancashire, due to the moist southern winds from the Atlantic Ocean, and accounts for the large number of mills located there and spinning fine counts of superior quality.

Considerable space has been devoted to explaining humidity, and an effort will now be made to show the direct application of it to mill conditions. The moving parts, principally the belting, are continually creating frictional or static electricity. Insufficient relative humidity allows this electricity to influence the cotton fibers, causing them to lose their cohesion and causing them to separate and stand up. This makes fuzziness in the strand of sliver, roving or yarn. If the relative humidity is sufficient, then this influence of static electricity on the fibres will be neutralized as the moisture is a good conductor of electricity.

Another very valuable result obtained by having the proper humidity, is the comfort given the operatives, thereby making it possible for them to do more efficient work. Everyone working in a cotton mill has seen evidences of the influence of static electricity on the stock due to the lack of the proper amount of moisture. A common example is often given on the card. The web refuses to leave the doffer and follows it around. Water is then sprinkled on the floor to "kill" the eletricity, and in a short time the web will enter the trumpet and form a sliver. Another example is the frequent breaking down of the ends on the spinning frame with nothing apparently wrong. The electricity has caused fuzziness to exist in roving and yarn, thereby weakening it. An example of the bad effects of cold are seen in a card room at a temperature of 65 degrees F. or less. The web will break down on the cards due to the absence of sufficient heat to melt the natural wax coating of the fibres.

The illustration Fig. 1 is a photograph of two cotton yarns both spun on the same frame in the same mill. The one on the left was spun with insufficient relative humidity

present and shows the fuzziness due to the action of the frictional electricity. The yarn to the right was spun with the proper percentage of relative humidity and is an even smooth thread. These examples clearly show that the proper conditions of heat and moisture greatly influence the quality and production and at the same time reduce waste.

The instrument for ascertaining the humidity is known as the hygrometer, or wet and dry bulb thermometer. The dry bulb thermometer is of the ordinary kind and registers the temperature of the room. The wet bulb thermometer having a piece of muslin wrapped around the bulb, with one end of the muslin placed within a small jar of water directly under the bulb. These two thermometers are placed alongside one another. The muslin conducts the water to the bulb.

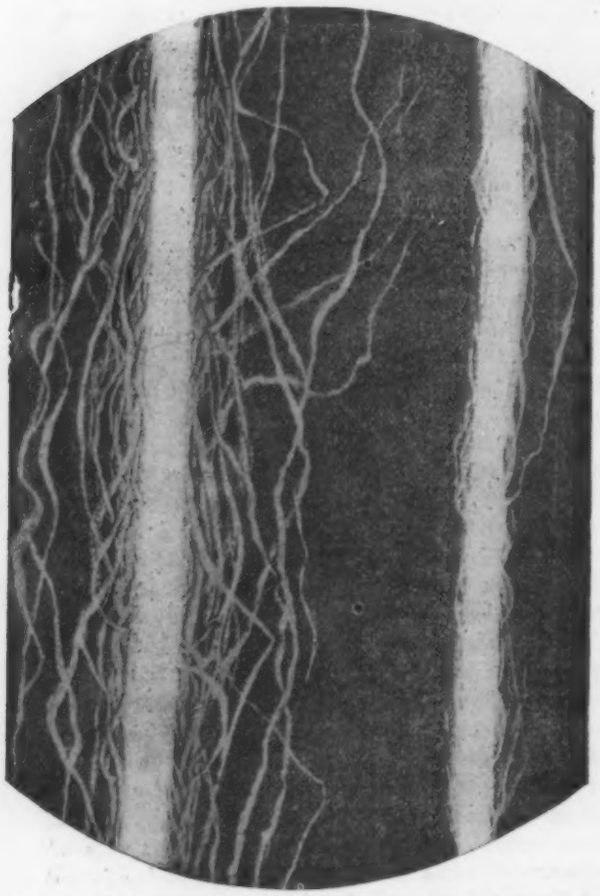


FIG. 1. TWO COTTON YARNS SHOWING THE DIFFERENCE IN WORKING WITH PROPER AND IMPROPER HUMIDITY.

The principle of the hygrometer is that the warmer the air, the more moisture it is capable of holding, and therfore the faster will be the evaporation from the wet bulb. When the water evaporates from the wet bulb it takes away heat from the thermometer and the temperature falls. As the air approaches the saturation point for moisture, the rate of evaporation on the wet bulb decreases, consequently the temperature of the wet bulb goes up. When the air becomes saturated with moisture there is no longer any evaporation from the wet bulb and since there is nothing to cool the wet bulb, it registers the same as the dry bulb. Therefore the lower the percentage of moisture in the atmosphere for any given temperature the greater will be the difference between the reading on the wet and dry bulb thermometer.

A humidity table which is largely used has been issued by the Draper Co. This table gives the recommended readings for the wet bulb in the weaving, spinning and carding departments for every degree of temperature from 60 degrees to 100 degrees inclusive. The readings recommended for the wet bulb represent what that thermometer should register for a certain relative humidity. These recommendations should not be considered as positive as conditions vary in different localities. Common sense should be used after carefully observing the results under varying conditions. The greatest relative humidity is desired in the weave room, due to the many belts and moving parts on the looms. The close proximity of the warps to the parts producing static electricity, together with the necessity for a high tensile strength and elasticity in the warp yarns, makes it necessary for a high relative humidity in the weave room if good cloth and a large production are expected. The card room needs less relative humidity than either the weaving or spinning rooms.

A section of the Draper table of recommended humidity for cotton mill conditions follows:

| Dry Bulb. | Weave Room Wet Bulb. | Spinning Room Wet Bulb. | Card Room Wet Bulb. |
|---|---|---|---|
| 68° | 65° | 63° | 59° |
| 69° | 66° | 64° | 60° |
| 70° | 66° | 64° | 60° |
| 71° | 67° | 65° | 61° |
| 72° | 68° | 66° | 62° |
| 73° | 69° | 67° | 63° |
| 74° | 70° | 68° | 64° |
| 75° | 71° | 69° | 65° |

It is easy to see if the hygrometer readings compare with those called for by the table, and if there is a variation showing too much or too little humidity, it can be overcome by supplying a smaller or greater amount of moisture through the humidifiers. Readings of the hygrometer should be made at frequent intervals during the day and an effort should be made to keep the proper relation between the temperature and humidity.

Draper's table does not directly show the relative humidity, but gives the reading which the wet bulb should show at a given temperature for a certain relative humidity. The following table for 5 degrees of temperature will show the data on which these wet bulb readings were made:

| Dry Bulb | Card Room | | | Spinning Room | | | Weave Room | | |
|---|---|---|---|---|---|---|---|---|---|
| | grains of moisture per cu. ft. air at saturation. | Wet Bulb. | % relative humidity. | actual grains of moisture per cu. ft. of air. | Wet Bulb. | % relative humidity. | actual grains of moisture per cu. ft. of air. | Wet Bulb. | % relative humidity. | actual grains of moisture per cu. ft. of air. |
| 68° | 7.5 | 59° | 60% | 4.5 grs. | 63° | 75% | 5.6 grs. | 65° | 85% | 6.36 grs. |
| 70 | 8.07 | 60 | 60 | 4.7 | 64 | 72 | 5.8 | 66 | 79 | 6.36 |
| 75 | 9.39 | 65 | 58.5 | 5.5 | 69 | 72 | 6.82 | 71 | 80 | 7.5 |
| 80 | 11.03 | 69 | 56 | 6.14 | 73 | 71 | 7.34 | 75 | 76 | 8.45 |
| 85 | 12.78 | 74 | 57 | 7.27 | 77 | 66 | 8.45 | 79 | 73 | 9.39 |

To find the relative humidity from the readings of the dry and wet bulb thermometers, Glaisher's factors must be used. The table showing these factors follows:

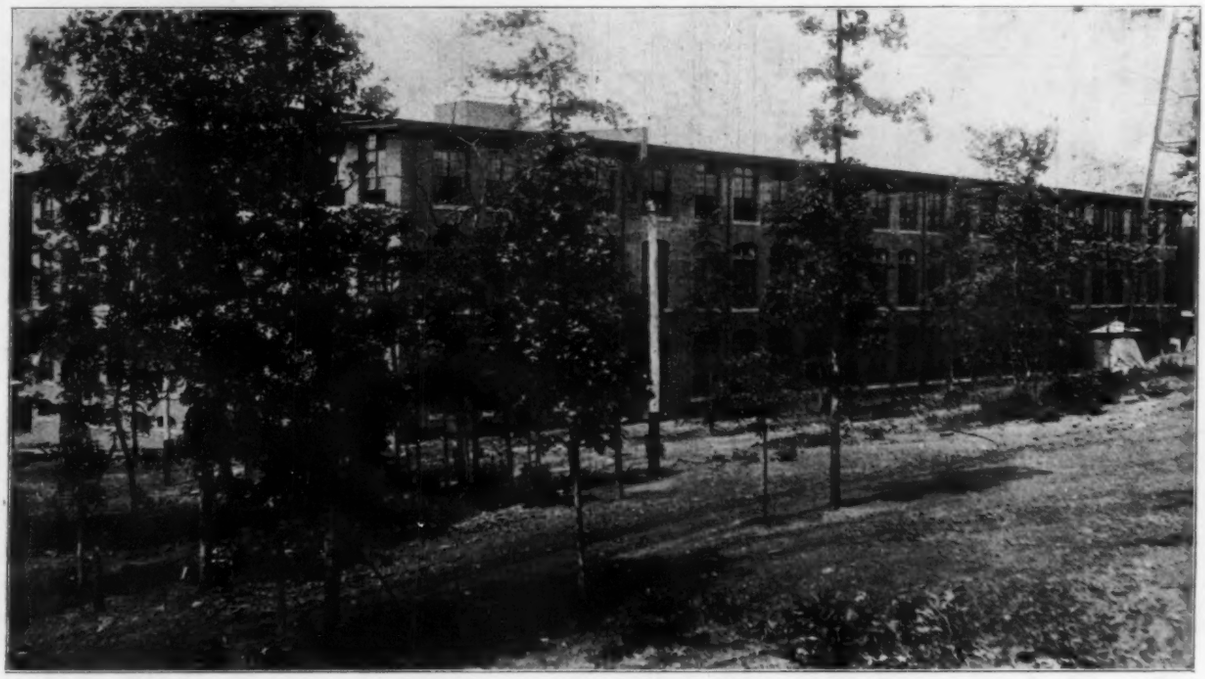
(*Continued on page 125.*)

# Another Type of Mill Construction

BY J. E. SIRRINE.*

The new plant of the Clinchfield Manufacturing Company at Marion, North Carolina, which has just been put into operation, is a 25,000 spindle mill, designed for the manufacture of wide print cloth. The property upon which the plant is located consists of 74 acres of rolling, well drained land, about 1½ miles from Marion, N. C. The larger part of the property is covered with original growth of hard wood forest, making an unusually desirable site for a plant of this character.

In locating the streets and houses for the mill village, care was taken to preserve as many of the large trees as possible, and as a result, practically every house is well shaded. To obtain a similar growth on land which has been in cultivation would require a large expenditure of money, as well as many years of time.



FRONT VIEW OF THE MILL BUILDING.

The mill building consists of a 3-story main building and 1-story extension to which is attached a 2-story engine room and a 1-story boiler house. There is a large basement extending entirely under the mill building, part of which is used for a machine shop, part for a dust room and the balance for shafting area.

The cotton warehouses are 1-story standard warehouse buildings, with opening room attached where all of the cotton opening and mixing is done.

There is located in the opening room a bale breaking feeder into which cotton is fed and from which point it is delivered through a conveying system and condenser to the picker room, which is located on the second floor of the mill. From this point it passes through the regular processes in the card room, which is located on the same floor as the picker room, and is delivered to an elevator, near the end of the building, in the form of finished roving.

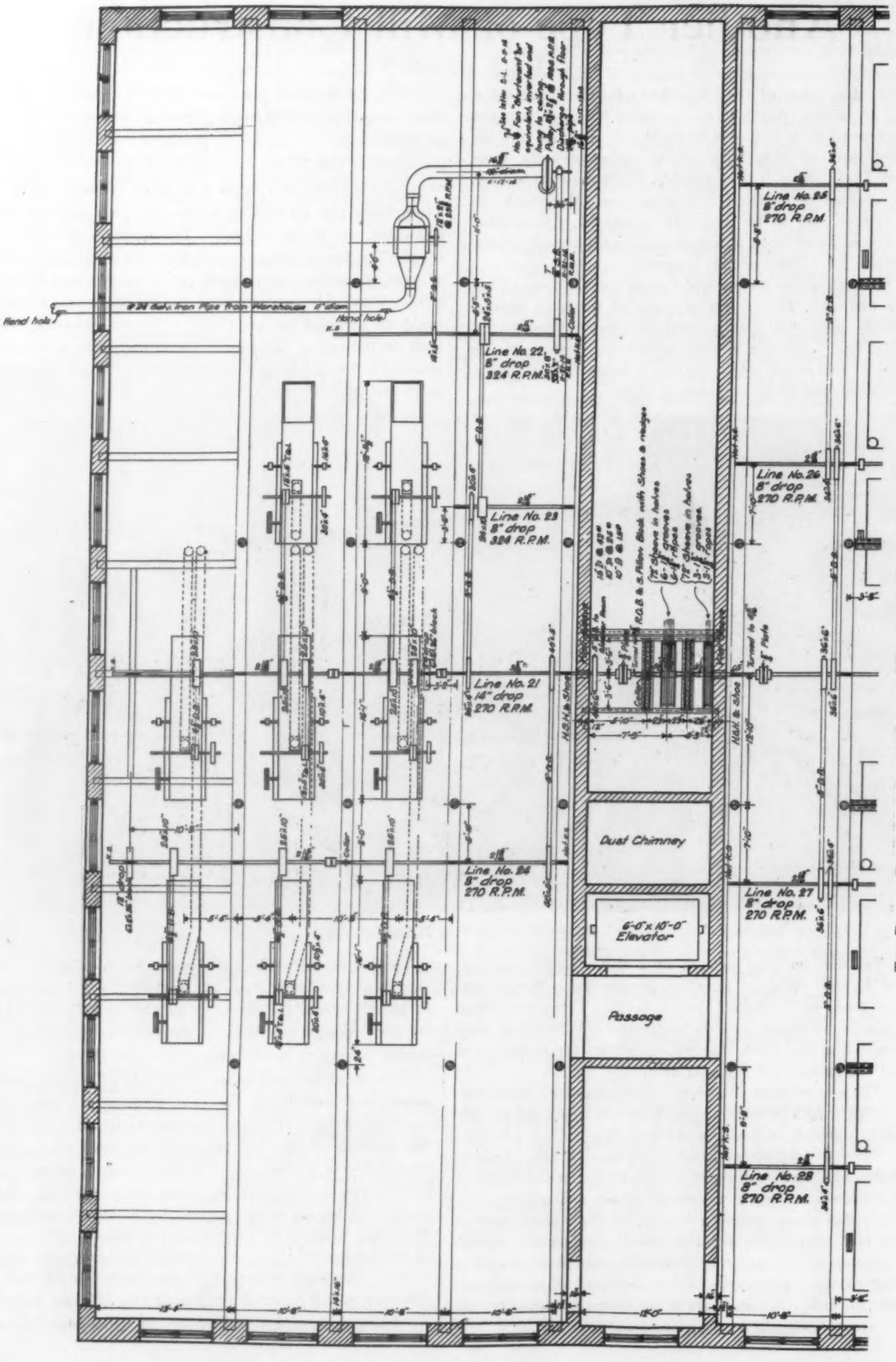
*Mill Architect and Engineer, Greenville, S. C.

The spinning room is on the third floor and the yarn after being spun goes through a passage way to the spoolers and warpers, which are on the same floor level, but on the opposide side of the fire wall which divides the picker room end of the mill from the main building proper. After being put on section beams, the yarn goes to the first floor, on which is located the slasher and tieing-in room. The looms being also on the first floor, the travel of yarns from the slasher room to the weave room is very short. Inasmuch as the looms require more space than could be obtained on one floor, a 1-story extension was built on the end of the mill, opposite the picker room and in order to avoid having a wall through the weave room the main end wall of the 3-story building is carried on steel "I" beams, supported by cast iron columns. This gives an unbroken room large enough to contain the full equipment of looms. From the weave room the cloth is carried to the cloth room, which is at the same end of the mill as the slasher room and immediately in the rear of it.

The shipping track being at this end of the mill, ready access is afforded from the cloth room to the cars. The elevation of the cloth room, however, is considerably above the elevation of the shipping track and the cloth is therefore delivered to the proper level through a spiral chute.

The power plant consists of a heavy duty cross-compound condensing engine, having cylinder 20 and 44 x 48 inches, running 90 revolutions per minute. The power is transmitted mechanically through ropes to the various floors. The main fly-wheel of the engine is 18 feet in diameter and is grooved for twenty-two 1¾ inch ropes.

Steam is supplied from four 200 horsepower vertical




THE PICKER ROOM AND ONE END OF THE CARD ROOM ON THE SECOND FLOOR.

Manning boilers, built for 200 pounds pressure. Boiler feed pumps are provided in duplicate, each of which is capable of taking care of the full capacity of boilers. Feed water is heated in a 1,000 horsepower open heater using exhaust steam from the boiler feed pumps, make-up pump and condenser pump.

The condenser is of the barometric type and is designed to produce 26 inches of vacuum with injection water at 90 degrees. Circulating water for the condenser is furnished by a direct-acting single cylinder piston pump.

Water for condensing purposes is obtained from a large reservoir immediately in rear of the boiler house and is returned to the same reservoir at the lower end. Inasmuch as the supply of fresh water is very large no cooling system was installed. The reservoir was constructed by building an earth embankment with concrete spillway across a stream in the rear of the mill, very little excavation being necessary to obtain the required capacity. Provision is made so that the stream can be diverted through an auxiliary canal during storms or at such times as the water is very muddy. This is done to prevent the pond from filling up. Provision is also made, however, for drawing off the reservoir should it ever become necessary, but it is believed that it will not be necessary to do this often.

It may be interesting to go somewhat into detail regarding the reason why mechanical drive was adopted in this particular plant, and as to why a three-story building was built instead of some other type.

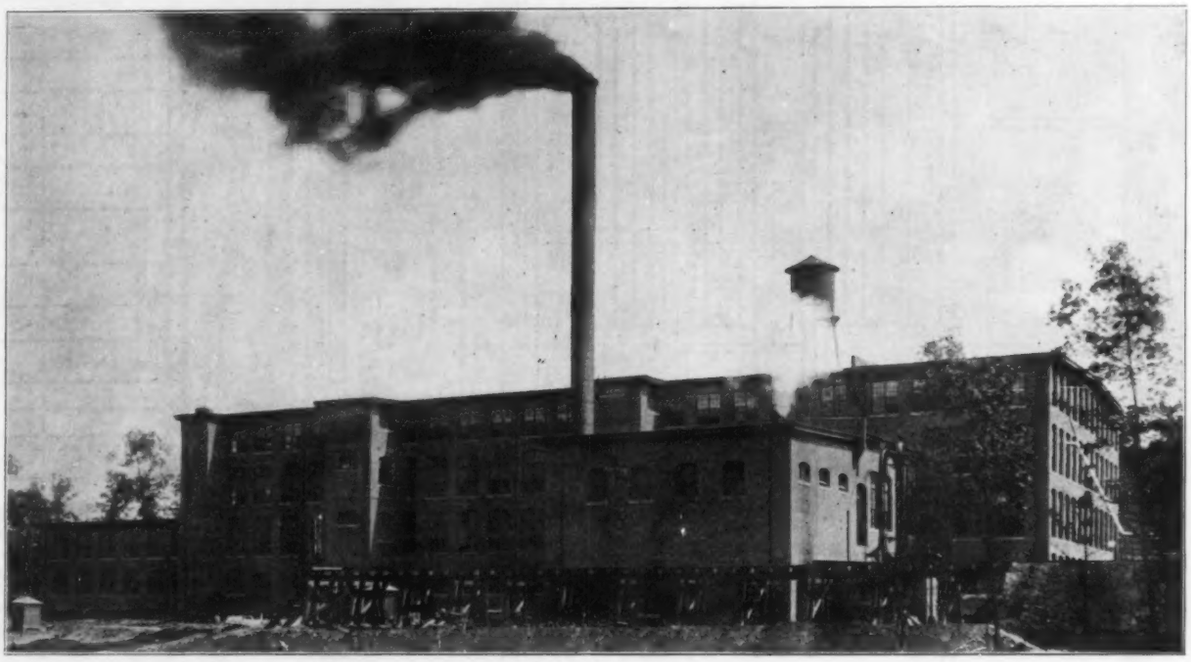
The writer believes "there is no must and there is no always" in the engineering business, therefore each particular case must be decided on its own merits.

Marion, North Carolina, is near the foot of the mountains in a very rolling country and the particular site on which this mill is situated, while ideal in many respects, contains no large area of level or even nearly level ground upon which a very long or a very wide building could be built without a waste of materials in foundation walls. A careful estimate was made as to the probable cost of a 2-story mill building and 1-story weave shed, as against a 3-story building and a 4-story building. It was found that the difference in cost between a 3-story building and a 4-story building was very slight, as practically all of the basement of the 3-story type could be used for machine shop and shafting area.

From the standpoint of operation the advantage would lie with the 3-story building, as all looms could be placed on one floor with shafting underneath.

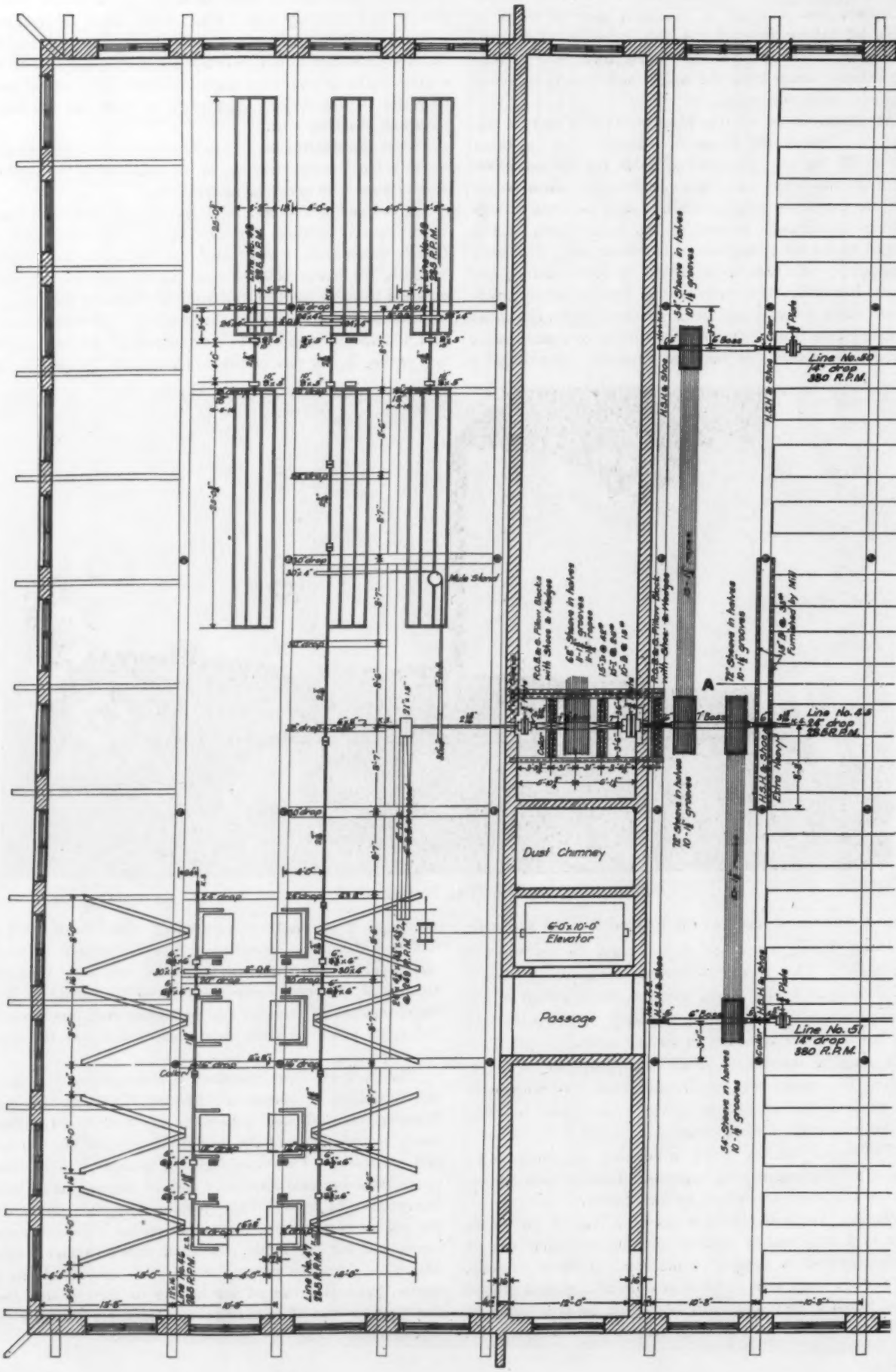
In comparing the cost of a 3-story building with that of a 2-story building for carding and spinning and a 1-story weave shed, it was found that the former type could be built for about $20,000 less, taking into account not only the building but fire protection and heating as well.

Owing to the nature of the ground, if electrical drive was adopted it would have been impossible to have made any saving in the cost of the building, and the cost of the individual drive electrical equipment would have made a further difference of practically $20,000, without as much compensating advantages as might be ordinarily obtained because of the very compact nature of the plant. It was therefore decided that for this particular case, the mechanical drive would be more economical and it was therefore adopted.

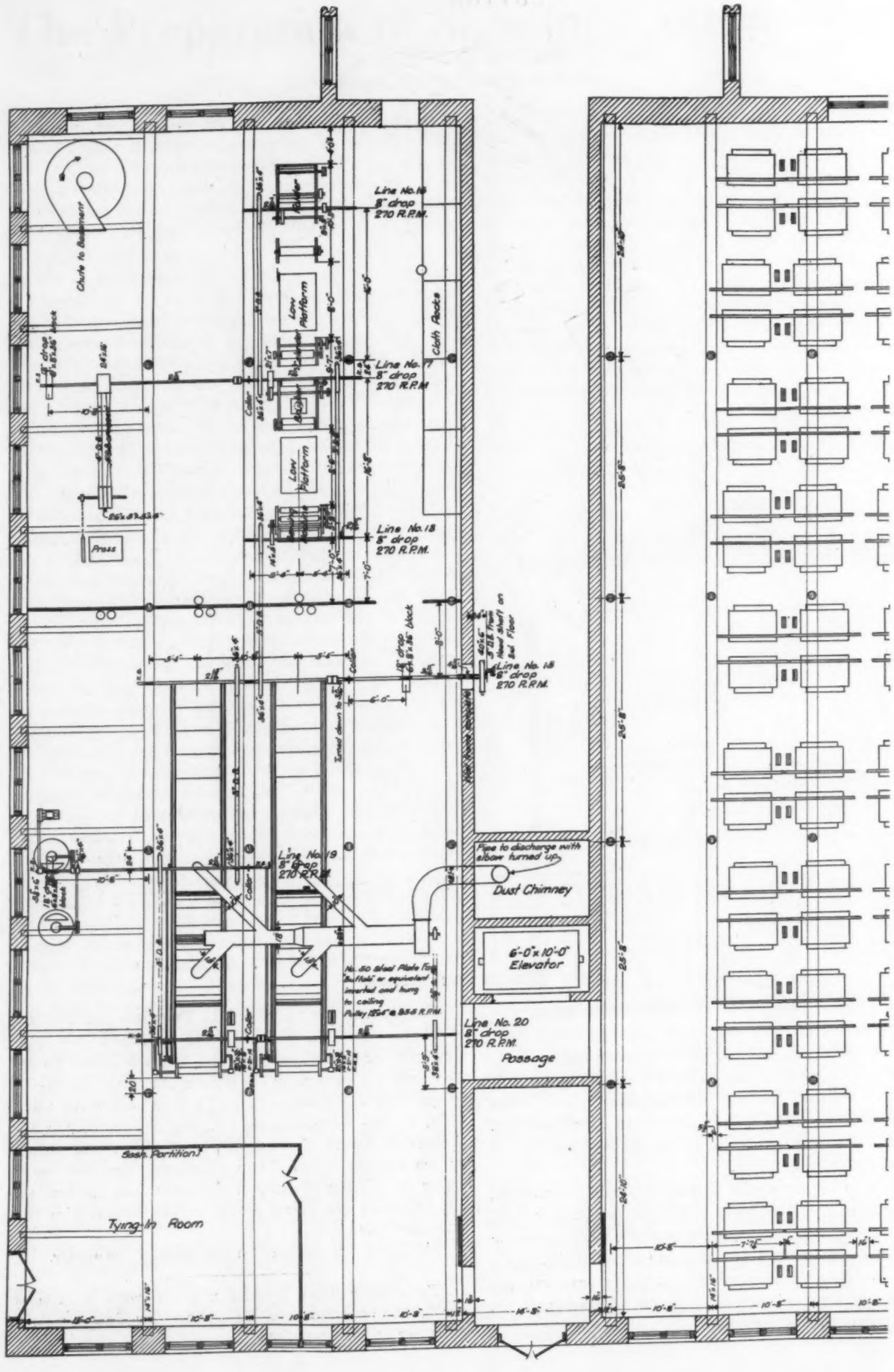


REAR VIEW OF THE MILL BUILDING.

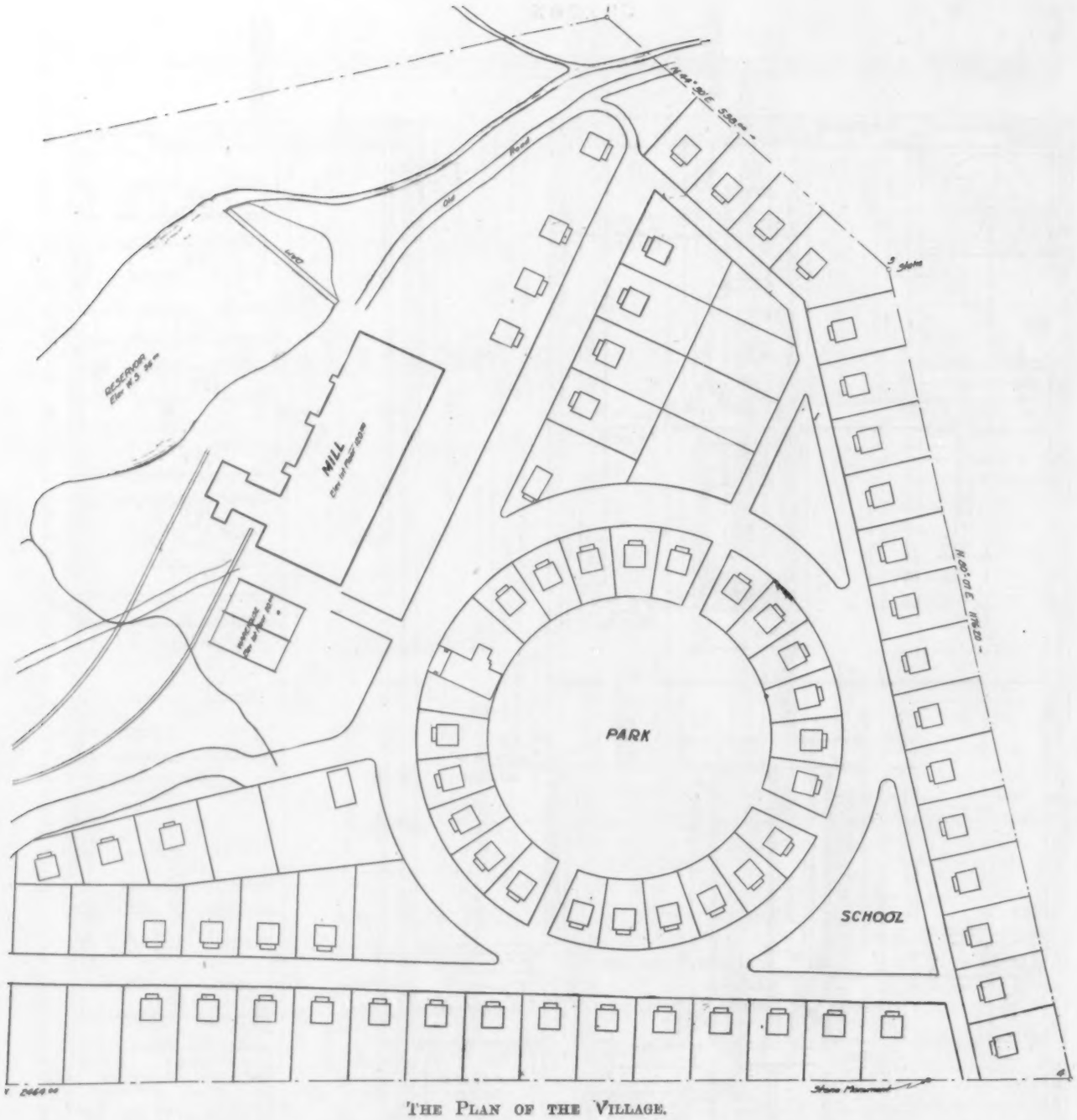
The electrical lighting system is arranged for simplicity and flexibility in operation. 60-watt Mazda lamps, with Wheeler intensive steel reflectors, are used in all departments at proper mounting heights as required for the several processes. The main lighting generator is a three-phase revolving field alternator and, of course, has no large commutator to wear. This machine furnishes power for the opener room motor, the motors on the air conditioning heads and for the lights. A small direct current marine engine set furnishes power for the pilot lights, and has its engine flywheel arranged for belting to the machine shop shafting so that it can drive the shop mechanically for over-time work.




SPOOLING AND WARPING ROOMS SHOWING KOPE DRIVE AND ONE OF THE SPINNING ROOMS ON THE THIRD FLOOR WHICH CONTAINS 100—252 SPINDLE SACO-LOWELL RING FRAMES.




CLOTH ROOM, SLASHER ROOM AND ONE END OF THE WEAVE ROOM ON THE FIRST FLOOR OF THE MILL. THE WEAVE ROOM CONTAINS 600—40-INCH "E" MODEL DRAPER LOOMS.




THE PLAN OF THE VILLAGE.

Double throw switches on the switchboard are so arranged that the pilot lights may be operated either from the small marine set, or from the large alternator.

The general plan of the mill yard and village, photographs of the main building and machinery plans, giving detailed arrangement of the machinery, are shown herewith, from which a very good idea of the general features of the plant may be obtained.

Owing to the unusually favorable climatic advantages, it is believed that this plant should be particularly fortunate in obtaining low operating cost and should have no difficulty in obtaining a plentiful supply of skilled labor.

D. D. Little of Spartanburg, S. C., is president and treasurer of the plant and H. F. Little of Marion, N. C., is vice-president and manager.

The building was built by T. C. Thompson and Brothers of Charlotte, N. C., the card room machinery and spinning room machinery was furnished by Saco-Lowell Shops; the looms and warpers by the Draper Company; the engine by the Nordberg Manufacturing Co.; the boilers and stack by R. D. Cole Manufacturing Co.; the air conditioning apparatus by Stuart W. Cramer; the condenser and pumps by the Buffalo Steam Pump Company; the feed water heater by Warren Webster & Company, and the heating, fire protection and power piping by the General Fire Extinguisher Company.

The plant was designed in the office of the writer.

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The average cotton production of the world is 13 bales per 1,000 population, and the average for Texas is 1,000 bales per 1,000 population.

# The Preparation of Size for Cotton Warps

BY G. M. MACNIDER*

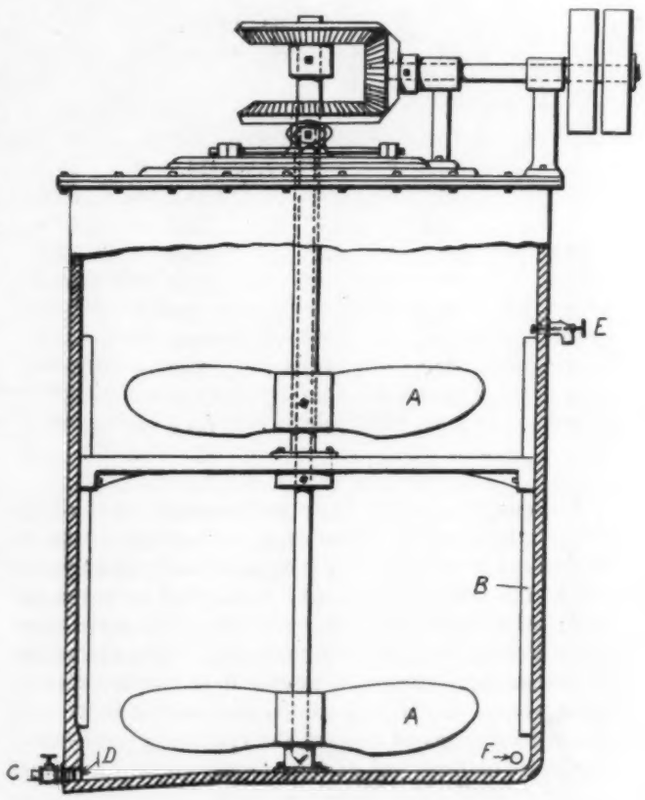
(*Copyright* 1916 *by G. M. MacNider.*)

One of the most general causes of trouble in sizing is lack of proper attention to mixing and boiling the starch. For ordinary sizing the preparation of the size mixture is not a complicated matter, but very inferior work results if the mixing is not properly done and the boiling given the necessary attention.

For ordinary sizing the proper procedure for making up the size is as follows: The proper amount of cold water is first run into the kettle (hot water will cause the starch to lump, hence the necessity of using cold water) the starch is then accurately weighed and added to the water. The mixture of starch and water should be thoroughly agitated for at least fifteen minutes before the steam is turned on, this produces a smooth cream so that when the steam is turned on the starch cooks uniformly and does not lump. After the starch has been thoroughly mixed the steam is turned on and the softener accurately weighed and added to the kettle. The mixture should be boiled with live steam for not less than one hour before being used. After the boiling is finished the size should be either run into a storage kettle or kept hot in the size kettle by means of a closed steam coil. The open steam coil should not be used after the size is finished as the condensation will dilute the mixture. The size must also be kept hot in the size box. This is usually done by means of a perforated steam coil in the bottom of the box. Only sufficient dry steam to keep the size hot should be allowed to enter the size. If the steam is properly regulated the condensation in the size box will about equal the evaporation from the size box and kettle and hence the mixture will have about the same consistency throughout the run. As stated, this procedure should be followed for ordinary sizing, when sizing is being done for special purposes, such as weighting, or where the starch is treated chemically in the kettle special processes must be adapted for that particular work.

As is well known the starch granules break up or gelatinize before the mixture reaches the boiling point, but in order to thoroughly disintegrate the starch particles and produce a uniform size it is necessary to boil the mixture thoroughly and hence it is recommended to boil the mixture not less than one hour, as this has been found by experience to be the best length of time. However, if the steam used for boiling is "wet" the condensation of the steam during an hour's boil will make the size too thin and hence the steam should be trapped before it goes to the kettle. This will permit the size to be boiled the proper length of time without unnecessary condensation.

The importance of accurately measuring the water used and weighing the starch and softener cannot be too strongly emphasized. It is impossible to produce uniform size unless the ingredients for each mixing are properly weighed. The slasher room should be provided with two scales for this purpose, one for weighing the starch and a smaller one for weighing the softener. Under no conditions should the starch be measured. Commercial starches are put out in the following forms: pearl, powder, small lump, large lump and crystal. On account of the air spaces between the particles a given volume of one form of starch will not weigh the same as the same volume of another form of starch; for example a bucket of starch in pearl form will not weigh the same as a bucket of starch in lump form, and so on with the different forms. Also with starch of one particular form the size of the lumps or particles are not all the same and hence there will be a variation in the same grade of starch. These examples are given to show the necessity of weighing the starch as it is used. Accuracy in measuring the water used is equally as important as weighing the starch and softener. The accompanying cut shows a very satisfactory type of size kettle with a device for regulating the volume of water used.




The kettle is similar to the usual form of size kettle with the following exceptions: There are two agitators (A) which revolve in opposite directions, these are constructed similar to a boat propeller, having three blades. The lower agitator is placed near the bottom of the kettle and the blades are set so that they will throw the size upwards, the upper agitator is placed above the middle of the kettle and the blades are set so that they throw the size downward. Placed opposite to each other are two vertical vanes (B) which project about three inches into the kettle. These prevent any swirling of the size. The double agitators with these vanes produce very thorough mixing of the size from bottom to top and prevent the formation of lumps. The draw-off valve (C) opens into a slanting de-

*Chemical Engineer Corn Products Refining Company.

pression or pocket in the bottom of the kettle shown at (D). This insures the complete emptying of the kettle and facilitates washing out. Another important addition is the water-level valve shown at (E). The object of this valve is to insure the same volume of water being used in each mixing of size. For example; if 130 gallons of water is to be used per mixing the capacity of the kettle is determined and the valve inserted in the back of the kettle at the 130 gallon level. Then, in making up the size the water-level valve is opened and the water turned in, when the kettle contains 130 gallons the water will run out through the valve, the water is then turned off and the water-level valve closed before adding the starch. This entirely does away with the measuring stick or guessing at the volume of water. The valve should be the reverse type so that any starch accumulating in the valve during cooking will be thrown out when the valve is next opened. A section of the perforated steam coil for cooking is shown at (F).

The following tables show the capacities of the standard sizes of kettles at different depths:

| 32″ Diam. 32″ Deep. | 33″ Diam. 42″ Deep. | 36″ Diam. 36″ Deep. | 42″ Diam. 42″ Deep. | 48″ Diam. 48″ Deep. |
|---|---|---|---|---|
| 1″ ..... 3.5 gals. | 1″ ..... 3.7 gals. | 1″ ..... 4.4 gals. | 1″ ..... 6.0 gals. | 1″ ..... 7.8 gals. |
| 2″ ..... 7.0 " | 2″ ..... 7.4 " | 2″ ..... 8.8 " | 2″ ..... 12.0 " | 2″ ..... 15.6 " |
| 3″ ..... 10.5 " | 3″ ..... 11.1 " | 3″ ..... 13.2 " | 3″ ..... 18.0 " | 3″ ..... 23.4 " |
| 4″ ..... 14.0 " | 4″ ..... 14.8 " | 4″ ..... 17.6 " | 4″ ..... 24.0 " | 4″ ..... 31.2 " |
| 5″ ..... 17.5 " | 5″ ..... 18.5 " | 5″ ..... 22.0 " | 5″ ..... 30.0 " | 5″ ..... 39.0 " |
| 6″ ..... 21.0 " | 6″ ..... 22.2 " | 6″ ..... 26.4 " | 6″ ..... 36.0 " | 6″ ..... 46.8 " |
| 7″ ..... 24.5 " | 7″ ..... 25.9 " | 7″ ..... 30.8 " | 7″ ..... 42.0 " | 7″ ..... 54.6 " |
| 8″ ..... 28.0 " | 8″ ..... 29.6 " | 8″ ..... 35.2 " | 8″ ..... 48.0 " | 8″ ..... 62.4 " |
| 9″ ..... 31.5 " | 9″ ..... 33.3 " | 9″ ..... 39.6 " | 9″ ..... 54.0 " | 9″ ..... 70.2 " |
| 10″ ..... 35.0 " | 10″ ..... 37.0 " | 10″ ..... 44.0 " | 10″ ..... 60.0 " | 10″ ..... 78.0 " |
| 20″ ..... 70.0 " | 20″ ..... 74.0 " | 20″ ..... 88.0 " | 20″ .....120.0 " | 20″ .....156.0 " |
| 30″ .....105.0 " | 30″ .....111.0 " | 30″ .....132.0 " | 30″ .....180.0 " | 30″ .....234.0 " |
| 32″ .....112.0 " | 40″ .....148.0 " | 36″ .....158.0 " | 40″ .....240.0 " | 40″ .....312.0 " |
| | | | 42″ .....252.0 " | 48″ .....374.4 " |

The quality of water has a very material effect on the size. It is therefore advisable to use distilled water to obtain the best results. The most satisfactory arrangement and at the same time the most economical is to run the condensed water from the slasher cylinders into tanks where it is allowed to cool and then pumped up to the size kettles.

*Circulating Systems*: Whenever it is possible a circulating system should be used for size, as this is the only satisfactory means of keeping the consistency or viscosity of the size uniform, and uniform results cannot be obtained on the finished goods unless the warps for any particular construction are uniformly sized. Such systems are more expensive than the old method of handling size, but the results obtained more than compensate for the extra cost.

Two systems are in use; in one system the size is circulated through parallel pipes above the size box and the size is drawn out into the boxes as it is needed; in the other system the size is circulated through the size box and the size is kept at a constant level in the box. This is the system which should be used. The only advantage of the first system being that the size is not allowed to cool down in the pipes, but it does not maintain a constant level and does not keep the size of uniform viscosity.

There are a number of ways of arranging a circulating system, the arrangement depending on the space available, number of slashers, etc. One of the most satisfactory arrangements is to have the kettles on the floor of the slasher room and to have in addition to the cooking kettles a storage kettle, which is either steam jacketed or equipped with a closed steam coil for keeping the size hot. The arrangement of the pipes is as follows: The outgoing pipe runs above the size boxes, having a delivery pipe for each box, the pump for delivering the size is so connected that it can draw from both the cooking kettles and the storage kettle. The return pipe is laid on the floor or preferably under the floor. This receives the overflow from each size box. The pump for returning the size draws from this pipe and delivers into the storage kettle. When the size is made up it is pumped from the cooking kettles through the system and returned to the storage kettle. When the cooking kettle is empty the pump is connected to the storage kettle and the size pumped out from there.

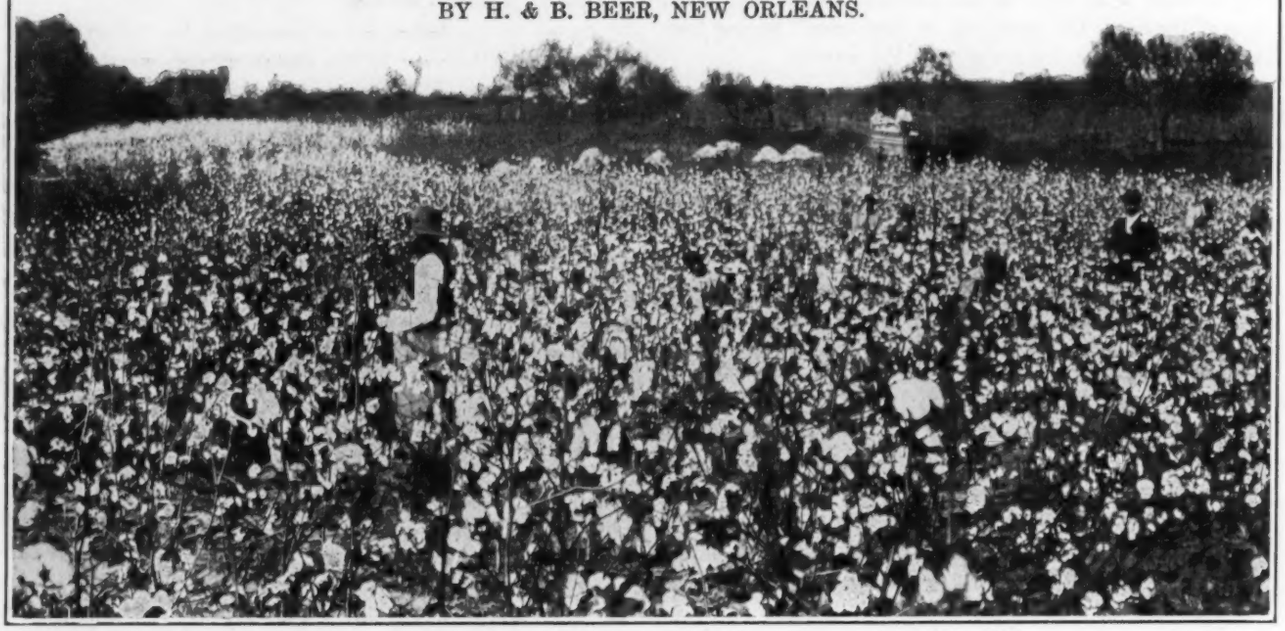
Another arrangement is to have the kettles on an elevated platform. The size is then allowed to run by gravity through the outgoing pipe and is pumped up to the storage kettle. Such an arrangement requires only one pump and is satisfactory where there are only one or two slashers, but with more than two slashers it is best to pump the size through the outgoing pipe.

There are a number of arrangements for maintaining a constant level in the size box and handling the overflow. With any system adopted for maintaining a constant level in the size box the arrangement should be as simple as possible, so that it will not require extra attention and can be readily cleaned out when steam is blown through the pipes. The overflow pipe can be simply a receiving pipe fixed in the size box at the proper level and another pipe inserted in the bottom of the box for drawing off the size at the end of the day. A very satisfactory arrangement is as follows: The overflow pipe is inserted in the end of the size box at the bottom and connected through a three way valve to a loop of pipe the top of which is at the height at which it is desired for the size to stand in the box. During operation the size is allowed to flow through the upper half of the loop and into the return pipe, thus keeping the size in the box at a constant level. When not operating the valve is reversed and the size allowed to flow through the lower half of the loop, thus draining the size box. A pet cock should be placed at the top of the loop to prevent

(*Continued on page 131.*)

# A Review of the Year in Cotton

BY H. & B. BEER, NEW ORLEANS.



(Copyright by Marcus L. Brown.)

A GEORGIA COTTON FIELD.

The depression in the cotton markets of the South at this time one year ago served to convince the planters that it was necessary to curtail the cotton acreage for the 1915 crop to a greater extent than for many years past, and of the necessity to grow larger grain crops, as the staple was selling at six cents a pound on the farm, while wheat, corn and oats were bringing the highest prices in nearly forty years. The low price of cotton and the high price of grain being directly due to the European war.

As a result there was carried on in the southern states a campaign of education on agricultural lines, advocating diversification of crops, as it was realized by merchants and bankers in the South that the making of another large crop of cotton would mean financial ruin for the southern states, from which it would take two years to recover. These efforts were not in vain, and much credit is due to the southern press for the valuable assistance rendered in convincing their readers that it was absolutely necessary for the South to plant more of food crops and raise less cotton, otherwise the result would be disastrous.

It was not until after the opening of the new year that the world became convinced that the cotton farmers were in earnest as to their intention of making a big cut in the acreage devoted to growing the staple. At that time the price of cotton was commencing to rise from its low level, the lowest in fifteen years. A large increase in the acreage of oats in the fall and in winter wheat, and a corresponding addition to the corn area in the cotton states in the spring served to impress spinners throughout the world that a much smaller acreage was to be planted to cotton. Consequently buying of a world-wide character made its appearance, causing a sharp rise in the price of cotton.

Thereafter the market continued to advance under the stimulant of an urgent spot demand and the official report that the acreage had been reduced 15.7 per cent, or from 37,406,000 acres in 1914 to 31,535,000 acres in 1915, which was the smallest area since 1905. The foreign demand became more urgent than ever, and exports to Europe, which some well informed people thought would not be 5,000,000 bales, reached a total of almost normal proportions, or 8,542,000 bales vs. 9,185,000 in season before last when all the world was at peace.

During all this time the progress of the new crop was watched with unusual interest. The planting season was favorable and the growing season was good until the Galveston storm in August, which caused a change for the worse. The storm made its way inland and damaged the crop in the eastern half of Texas. The weevils, which appeared in large numbers in the southern part of the state, were driven before the winds in nearly all sections of Texas, but this was not realized just then.

In the latter part of September the Mississippi Valley and east gulf states were visited by the second destructive storm of the season, New Orleans and adjacent territory suffering considerable loss in life and property, not to mention the harm inflicted on crops.

To cap the climax the third climatic disturbance of the year invaded the south Atlantic states, and while not so destructive, was, nevertheless, injurious, causing general heavy, damaging rains.

As was the case in Texas and the lower Mississippi Valley, the hurricane winds in the eastern belt carried the weevils to nearly all parts of Alabama, and for the first time the pest was discovered in southwest Georgia, gradually working its way into several western and southern counties of that great cotton state.

However, nature smiled upon the southland once more, and there was no real cold weather until the middle of

November, and the plant promised a beautiful yield, but the weevil was on the job, and although a general killing frost did not materialize until about three weeks later than the average date, little or no addition was added to the size of the crop; the usual fall, or "top crop," having been a failure owing to the activity of the weevils.

As a result and because of the big decrease in the acreage and in the use of fertilizer in the eastern half of the belt, the crop, as estimated by the government on December 10th, proved to be only 11,161,000 bales of 500 pounds gross weight, which, including linters, would make a total crop of only about 11,367,000 bales vs. 16,738,000 last year, a decrease of 5,371,000 bales.

It is for these reasons that market rose steadily to the 13 cents level without experiencing any reaction worthy of the name until some unwarranted large crop estimates were circulated the latter part of October, occasioning a decline of about $8 per bale.

In the meanwhile these large crop estimates have been proven incorrect by the light ginnings, and subsequently by the government's small crop estimate. To December 1st only 9,711,000 bales were ginned vs. 13,047,000 to corresponding date last year and 10,140,000 to even date in 1910 when the total crop, including linters, was only 11,966,000 bales.

Now that we have official advice as to the approximate size of the crop, more consideration will be given to the probable needs of the world this season. The U. S. Census Bureau reports that the consumption of cotton in the United States during the month of November was 593,000 bales, against 447,000 last year, for the first four months of the season, 2,572,000 or an average increase of 113,000 bales per month over the corresponding time one year ago, indicating a total consumption of all kinds for the season of about 7,356,000 bales, of American about 7,000,000 bales.

At the close of November of this year the number of active spindles in the United States was 31,497,000 compared with 30,425,000 last year, denoting that consumption in America during the remainder of the season will continue large.

Based upon the government estimate and the carryover from last year's crop, the United States can only supply about 14,000,000 bales this season, and as about 7,000,000 bales will likely be needed for home consumption, and as about 500,000 bales will be required on this side of the Atlantic next summer for port and interior stocks for protection to shorts in the American future markets, only about 6,500,000 bales will be available for export.

This season Europe and Japan will need at least 7,100,000 bales divided as follows, compared with last season: Great Britain, 4,000,000 vs. 3,806,000; the Continent, 2,500,000 vs. 4,061,000, and Japan 600,000 vs. 490,000, or a total of 7,100,000 against 8,357,000.

It is doubtful even if 6,500,000 bales will be available for export this season, as it is possible that Germany and Austria own a good part of the cotton in the interior for shipment after the war is over. It is evident, therefore, that there will be a famine of American cotton in Europe before the next crop is available next October.

What of the next crop and next season's consumption? Because of the high prices prevailing, the South is planting for another large crop of grain. As a matter of fact Washington reports that the winter wheat acreage in the southern states has generally been increased. It is known that a large acreage is being planted to oats, and it is possible that there will be an increase in the corn acreage in the cotton belt next spring.

Owing to the better prices prevailing for cotton there may be some increase in the cotton acreage next spring, but the increase, if any, is not likely to be large. Merchants and bankers are financing the cotton now being carried in the South for higher prices, and as their interests are against a big increase in the cotton acreage, they will not encourage increased planting except for food crops.

Then the weevils, which are reported in large numbers and over a greater area than ever before, have to be reckoned with, and the knowledge of their presence and the destruction they wrought the past year, will influence farmers to diversify. Under the circumstances but little increase in the cotton acreage next year can be looked for.

With mules scarce and higher than last year, because of the heavy shipments to Europe for army purposes, with little or no German potash to be had for fertilizing purposes, and with the presence of the weevils to contend with, what assurance is there for the making of a large cotton crop in 1916?

On the other hand indications are that a large crop will be needed by the world next season, as supplies of American cotton next season will be reduced to the minimum. They are about exhausted already in Germany and Austria, and are likely to be at the famine point in the British Isles, France, Spain, Italy, Japan and Russia by next summer.

As a result of the European war, billions, not millions, in dollars are being spent in the neutral countries by the Allies for supplies of every description. Notwithstanding the blockade of Germany and Austria, the foreign trade of the United States (and the same may be said of other neutral countries) is the largest on record, promising to pass the billion dollar mark this year, with the possibility of reaching $1,500,000,000 next year, whether or not the war continues for another year. It follows then that the trade outlook for America is bright, brighter than it has been for many years past, and we believe that our country is on the threshold of one of the greatest periods of prosperity ever experienced by a people. We trust that our expectations will be realized, and if fulfilled, it will be due to a kind Providence who has favored our land with the blessings of peace, for which we must all be thankful.

## Furnishing Coal to the Operatives.

While the Southern Coal & Coke Company of Knoxville, Tennessee, is widely known to readers of COTTON as shippers of high grade steam coal, this company has one of the largest domestic coal trades of any company in the South. This domestic trade is not confined to the South but this company has three salesmen who continually cover the central west and northwest. Their domestic coals are all big sellers because of high quality; they are mined in a modern manner, carefully prepared, graded and shipped. Any companies who sell their coal to their employees or who may be in the retail business, will find the domestic sizes of the Southern Coal & Coke Company to be of most satisfactory quality.

# Annual Review of the New Bedford Mill Stock Market

BY SANFORD AND KELLEY.*

The business of the cotton mills of New Bedford for the year 1915 has shown a good deal of improvement, largely due to the war on the other side of the Atlantic which has prevented a flood of manufactured cotton goods being sent over here to the great disadvantage of our manufacturers; also largely due to the increased amount of cotton used by the women in their clothing.

There have been no new mills built during the year and but little change in those that are now in operation. A few spindles have been added so that the increase shows 4,656, and the looms show very slight changes, (an increase of 32). The number of employees increased 300—this because of the increased activity.

The Sharp Mfg. Co., has already voted to increase its capital stock by issuing $600,000 more preferred and $400,000 of common which will make the total capitalization of that mill $2,500,000, of which $1,200,000 will be preferred and $1,300,000 common. It is proposed building a new mill in the spring and installing 40,000 spindles. These spindles are not included in the tables, because they are not yet in operation.

The Holmes Mfg. Co. will spend perhaps $100,000 in erecting some small buildings in the rear of its present plant. Other mills will probably increase their spindles as they have room in the mills now erected.

The bonded indebtedness of the mills was reduced about $30,000, the Quissett taking up that many of its bonds, and it is ready to take up the whole as soon as they are presented.

The dividends paid during the year amounted to $3,112,300, against $1,878,518.50 in 1914, the increase amounting to about 65¾ per cent. This was caused largely by the payment by the Grinnell Mfg. Corporation of a $50 extra cash dividend and a 50 per cent stock dividend in June of this year—this from surplus accumulation of earnings for the past fifteen years; and also by the Potomska Mills declaring an extra dividend of $20 a share paid in October of this year from earnings which have accumlated ever since its incorporation in 1871, as it has never before paid an extra dividend.

The companies which increased their dividends over those paid in 1914 were: Bristol, which resumed dividends, paying 1¼ per cent in December; Grinnell from 8 per cent to 54 per cent on $1,000,000 capital and a 50 per cent stock dividend on the same amount; Neild ½ of 1 per cent, putting it on a 6 per cent basis; Potomska from 6 per cent to 26 per cent; and Sharp began paying dividends on its common stock, paying 4½ per cent in 1915.

The corporations to reduce their dividends in 1915 were: Butler common, 1½ per cent, paying nothing in 1915;

*Dealers in bonds and stocks, New Bedford, Mass.

FINANCIAL STATEMENTS OF NEW BEDFORD COTTON MILLS DECEMBER 31, 1915, COMPILED BY SANFORD AND KELLEY.

| ASSETS. | | | | LIABILITIES. | | | | |
|---|---|---|---|---|---|---|---|---|
| Land Buildings and Machinery. | Merchandise. | Cash and Accounts Receivable. | Name of Corporation. | Capital Stock and Bonds. | Bills and Accounts Payable. | Profit and Loss. Depre. & Reserves. | Surplus of Quick Assets. | Net Debt on Plant. |
| $ 860,000 | $ 535,496 | $ 215,460 | Acushnet Mills | $1,000,000 | ..... | $ 610,955 | $ 750,956 | ..... |
| 615,929 | 480,449 | *707,953 | Beacon Mfg. Co., Com. | 400,000 | $ 559,834 | 438,497 | 622,568 | ..... |
| ..... | ..... | ..... | Beacon Mfg. Co., Pfd. | 400,000 | ..... | ..... | ..... | ..... |
| 1,517,242 | 226,224 | 115,954 | Booth M'f'g. Co., Com | 500,000 | 84,370 | 340,051 | ..... | $242,192 |
| ..... | ..... | ..... | Booth Mfg. Co., Pfd. | 735,000 | ..... | ..... | ..... | ..... |
| ..... | ..... | ..... | Booth Mfg. Co., Bonds | 500,000 | ..... | ..... | ..... | ..... |
| 1,232,026 | 495,485 | 140,028 | Bristol Mfg. Co. | 1,000,000 | 568,283 | 299,258 | 67,230 | ..... |
| 2,060,781 | 516,122 | ‡166,849 | Butler Mill, Com. | 1,500,000 | 300,000 | 170,810 | 382,971 | ..... |
| ..... | ..... | ..... | Butler Mill, Pfd. | 750,000 | ..... | ..... | ..... | ..... |
| 900,000 | 383,085 | 105,292 | City Mfg. Co. | 750,000 | 534,915 | 103,462 | ..... | 46,538 |
| 3,116,847 | 882,062 | a938,202 | Dartmouth Mfg. Co., Com. | 2,000,000 | ..... | 1,434,366 | 917,519 | ..... |
| ..... | ..... | ..... | Dartmouth Mfg. Co., Pfd. | 600,000 | ..... | ..... | ..... | ..... |
| ..... | ..... | ..... | Dartmouth Mfg. Co., Bonds | 800,000 | ..... | ..... | ..... | ..... |
| 1,925,973 | 391,012 | 470,880 | Gosnold Mill Co., Com. | 825,000 | 781,400 | 360,466 | 80,492 | ..... |
| ..... | ..... | ..... | Gosnold Mill Co., Pfd. | 825,000 | ..... | ..... | ..... | ..... |
| 1,500,000 | 403,853 | 436,313 | Grinnell Mfg. Co. | 1,500,000 | 143,203 | 696,963 | 696,963 | ..... |
| 715,863 | 426,636 | 344,158 | Hathaway Mfg. Co. | 800,000 | ..... | 686,657 | 770,794 | ..... |
| 1,626,734 | 313,576 | 273,796 | Holmes Mfg. Co., Com. | 600,000 | 597,594 | 416,511 | ..... | 10,222 |
| ..... | ..... | ..... | Holmes Mfg. Co., Pfd. | 600,000 | ..... | ..... | ..... | ..... |
| 1,966,881 | 329,871 | 273,286 | Kilburn Mills | 1,500,000 | 456,026 | 614,012 | 147,131 | ..... |
| 2,850,000 | 1,356,809 | 256,842 | Manomet Mills | 2,000,000 | 1,409,023 | 1,054,619 | 204,619 | ..... |
| 3,897,278 | 605,123 | 523,568 | Nashawena Mills | 3,000,000 | 1,612,048 | 413,901 | ..... | 493,357 |
| 1,684,491 | 341,129 | 156,154 | N. B. Cotton Mill Corp., Com. | 350,000 | 339,322 | 267,452 | ..... | 317,039 |
| ..... | ..... | ..... | N. B. Cotton Mill Corp., Pfd. | 750,000 | ..... | ..... | ..... | ..... |
| ..... | ..... | ..... | N. B. Cotton Mill Corp., Bonds | 475,000 | ..... | ..... | ..... | ..... |
| 1,309,569 | 266,269 | 79,359 | Neild Mfg. Co. | 800,000 | 435,995 | 170,141 | ..... | 339,367 |
| ..... | ..... | ..... | Neild Mfg. Co., Bonds | 250,000 | ..... | ..... | ..... | ..... |
| 8,755,945 | 1,875,027 | b3,562,307 | New Eng. Cotton Yarn Co., Com. | 3,900,000 | 1,897,763 | 1,682,515 | ..... | 1,173,428 |
| ..... | ..... | ..... | New Eng. Cotton Yarn Co., Pfd. | 2,000,000 | ..... | ..... | ..... | ..... |
| ..... | ..... | ..... | New Eng. Cotton Yarn Co., Bonds. | 4,713,000 | ..... | ..... | ..... | ..... |
| 3,421,390 | 935,176 | 257,592 | Nonquitt Spinning Co. | 2,400,000 | 1,793,852 | 420,306 | ..... | 601,084 |
| 1,607,766 | 725,782 | c210,398 | Page Mfg. Co. | 1,000,000 | 744,554 | 259,391 | 191,626 | ..... |
| 600,000 | 1,003,721 | 291,566 | Pierce Mfg. Co. | 600,000 | 351,213 | 944,073 | 944,073 | ..... |
| 983,089 | 318,114 | 61,012 | Pierce Bros. (Limited) | 700,000 | 551,722 | 110,493 | ..... | 172,596 |
| 1,110,221 | 266,495 | 585,647 | Potomska Mills | 1,200,000 | 7,042 | 754,321 | 344,100 | ..... |
| 2,142,406 | 439,000 | 165,701 | Quissett Mill, Com. | 1,250,000 | 533,245 | 539,422 | ..... | 47,984 |
| ..... | ..... | ..... | Quissett Mill, Pfd. | 305,000 | ..... | ..... | ..... | ..... |
| ..... | ..... | ..... | Quissett Mill, Bonds | 94,500 | ..... | ..... | ..... | ..... |
| 1,747,195 | 718,377 | 210,179 | Sharp Mfg. Co., Com. | 900,000 | 946,319 | 329,132 | ..... | 17,763 |
| ..... | ..... | ..... | Sharp Mfg. Co., Pfd. | 500,300 | ..... | ..... | ..... | ..... |
| 1,699,936 | 356,896 | 99,997 | Soule Mill. | 1,260,000 | 652,217 | 244,611 | ..... | 195,324 |
| 1,673,607 | 315,445 | 81,426 | Taber Mill. | 1,300,000 | 485,429 | 290,050 | ..... | 83,558 |
| 2,450,000 | 1,002,697 | 531,442 | Wamsutta Mills. | 3,000,000 | 86,989 | 897,149 | 1,447,150 | ..... |
| 2,929,741 | 517,802 | d199,155 | Whitman Mills. | 2,000,000 | 755,036 | 891,461 | ..... | 38,279 |

*Includes $5,000 insurance.

†Shows $43,949 profit and loss on asset side, and $84,000 reserve for depreciation.

‡Includes $53,992 prepaid accounts.

a Includes $56,140 investments.

b Includes $709,173 for investments, $14,161 for suspense account and $259,282 for renewal account.

c Includes $2,124 for insurance and interest.

d Includes $43,183 prepaid accounts.

City from 4 per cent to nothing; and Page from 3 per cent to nothing.

The following mills paid no dividends which was also the case in 1914: Booth Mfg. Co. on common and preferred, Gosnold common, Nashawena, Pierce Bros., Ltd., and Soule Mills. The New Bedford Cotton Mills Corporation declared a dividend on its common stock but as this is held by two or three parties they will not announce the amount.

If business continues to improve as it has the last six months we suspect that all the mills who have not paid will commence dividends in 1916. Nashawena Mills without doubt will pay in January 1½ per cent per share, which is at the rate of 6 per cent per annum. City is earning enough to begin paying during the year. The Booth, it is expected, may begin dividends on its preferred some time during the year. The Soule Mill probably will begin the latter part of the year if they pay at all. Pierce Bros., Ltd., is a close corporation and the condition cannot be stated.

Because of the necessity for the early preparation of this review, it is impossible to give definitely the high and low prices for stocks for the year 1915 as the year had not passed when the report was prepared, but it is noticeable that all the mill stocks, those paying dividends and those which are not, have advanced quite largely: Acushnet advanced $35 a share; Grinnell, $45; Butler common, $11; City, $19; Quissett preferred, $18; Dartmouth preferred, $5; Holmes preferred, $17; Nonquitt, $19; Neild, $18; Sharp common, $15; Whitman, $17; Kilburn, $27; Butler preferred, $8; Quissett common, $47; Dartmouth common, $67; Holmes common, $75; Pierce, $100; Beacon preferred, $3; Page, $4; Sharp, preferred, $8; Potomska, $24; Soule Mill, $34; Booth preferred, $38; Taber, $20; Gosnold preferred, $10, and Bristol, $40.

These advances were those recorded up to December 18th, 1915.

The outlook for 1916 is very encouraging and if nothing unforeseen happens we expect to see an increase in the profits and also in the payment of dividends, and expect prices to advance considerably yet in most cases. Nearly all of the New Bedford mills are running full, and some of them running nights.

Statement of New Bedford, Mass., leading corporations, showing dividends to shareholders in 1915 on capital invested as follows:

| Corporations. | Capital. | Rate | Amount. |
|---|---|---|---|
| Acushnet Mills | $ 1,000,000 | 8 | $ 80,000.00 |
| Beacon Mfg. Co., Com. | 400,000 | 6 | 24,000.00 |
| Beacon Mfg. Co., Pfd. | 400,000 | 6 | 24,000.00 |
| Booth Mfg. Co., Com. | 500,000 | .. | ..... |
| Booth Mfg. Co., Pfd. | 750,000 | .. | ..... |
| Bristol Mfg. Co. | 1,000,000 | 1¼ | 12,500.00 |
| Butler Mill | 1,500,000 | .. | ..... |
| Butler Mill Pfd. | 750,000 | 7 | 52,500.00 |
| City Mfg. Co. | 750,000 | .. | ..... |
| Dartmouth Mfg. Corp., Com. | 2,000,000 | 10 | 200,000.00 |
| Dartmouth Mfg. Corp., Pfd. | 600,000 | 5 | 30,000.00 |
| Gilt Edge Silk Mill | 10,000 | | |
| Gosnold Mills Co., Com. | 825,000 | | |
| Gosnold Mills Co., Pfd. | 825,000 | 6 | 49,500.00 |
| Grinnell Mfg. Co. | 1,500,000 | 107 | *1,085,000.00 |
| Hathaway Mfg. Co. | 800,000 | 10 | 80,000.00 |
| Holmes Mfg. Co., Com. | 600,000 | 6 | 36,000.00 |
| Holmes Mfg. Co., Pfd. | 600,000 | 6 | 36,000.00 |
| Kilburn Mills | 1,500,000 | 6 | 90,000.00 |
| Manomet Mills | 2,000,000 | 8 | 160,000.00 |
| Nashawena Mills | 3,000,000 | .. | ..... |
| Neild Mfg. Co. | 800,000 | 5½ | 44,000.00 |
| N. B. Cotton Mills Co., Com. | 350,000 | † | ..... |
| N. B. Cotton Mills Co., Pfd. | 750,000 | 6 | 45,000.00 |
| Nonquitt Spinning Co. | 2,400,000 | 4½ | 108,000.00 |
| Page Mfg. Co. | 1,000,000 | .. | ..... |
| Pierce Mfg. Co. | 600,000 | 16 | 96,000.00 |
| Pierce Bros. (Limited) | 700,000 | .. | ..... |
| Potomaska Mills | 1,200,000 | 26 | 312,000.00 |
| Quissett Mill, Com. | 1,250,000 | 6 | 75,000.00 |
| Quissett Mill, Pfd. | 305,000 | 6 | 18,300.00 |
| Sharp Mfg. Co., Com. | 900,000 | 4½ | 40,500.00 |
| Sharp Mfg. Co., Pfd. | 600,000 | 6 | 36,000.00 |
| Soule Mill | 1,260,000 | .. | ..... |
| Taber Mill | 1,300,000 | 6 | 78,000.00 |
| Wamsutta Mills | 3,000,000 | 6 | 180,000.00 |
| Whitman Mills | 2,000,000 | 6 | 120,000.00 |
| | $39,725,000 | | $3,112,300.00 |

| | | |
|---|---|---|
| The dividends paid by New Bedford cotton manufacturing corporations in 1915 on $39,725,000 capital, amounted to | $3,112,300.00 | 7.83-100% |
| There was paid in 1914, on $39,225,000 | 1,878,518.50 | 4.76-100% |
| Increase | $1,233,781.50 | 65.67-100% |

*$50 per share extra on $1,000,000 capital and $3 per share on $1,500,000; also a stock dividend of 50 per cent paid.
†Dividend declared but not announced.

NEW BEDFORD COTTON MILL STATISTICS COMPILED BY SANFORD AND KELLEY.

| Name. | No. Mills. | Capital. | Bonds. | Spindles. | Looms | Employees. | PRODUCT. |
|---|---|---|---|---|---|---|---|
| Acushnet Mills | 2 | $1,000,000 | ——— | 105,336 | 3,700 | 1,050 | Sheetings, Twills, Cotton and Silk Goods. |
| Beacon Mfg. Co., Com. | 2 | 400,000 | ——— | 10,600 | —— | 850 | Blankets and Napped Goods. |
| Beacon Mfg. Co., Pfd | | 400,000 | ——— | —— | —— | —— | |
| Booth Mfg. Co., Pfd. | | 750,000 | ——— | —— | —— | —— | Plain, Fancies and Silk Goods and Novelties. |
| Booth Mfg. Co., Com. | 2 | 500,000 | $500,000 | 52,000 | 1,300 | 600 | |
| Bristol Mfg. Co. | 1 | 1,000,000 | ——— | 63,000 | 1,954 | 820 | Cotton and Silk Goods, plain and fancies, and Novelty Constructions. |
| Butler Mill Co., Com. | 1 | 1,500,000 | ——— | 105,000 | 2,100 | 850 | |
| Butler Mill, Pfd. | | 750,000 | ——— | —— | —— | —— | Fine Cotton, plain and fancies, Yarns. |
| City Mfg. Co. | 2 | 750,000 | ——— | 59,064 | Yarn | 600 | Carded and Combed Yarn from Peeler, Egyptian and Sea Island Cotton. |
| Dartmouth Mfg. Corp., Com. | 3 | 2,000,000 | 800,000 | 200,000 | 5,700 | 2,200 | Plain, Fancy and Jacquard Cotton and Silk Goods. |
| Dartmouth Mfg. Co., Pfd. | | 600,000 | ——— | —— | —— | —— | |
| Gilt Edge Silk Mill | 1 | 10,000 | ——— | —— | 128 | 30 | Dress Silk Goods for High Grade Cloaks. |
| Gosnold Mills Co., Com. | 2 | 825,000 | ——— | 82,232 | 3,250 | 1,100 | Fine Goods, plain and fancies, Jacquards. |
| Gosnold Mills Co., Pfd. | | 825,000 | ——— | —— | —— | —— | |
| Grinnell Mfg. Co. | 3 | 1,500,000 | ——— | 128,000 | 3,135 | 1,100 | Fine Cotton Goods, plain and fancies and with silk filling. |
| Hathaway Mfg. Co. | 2 | 800,000 | ——— | 109,892 | 3,700 | 1,020 | Fine Cotton and Silk Goods. |
| Holmes Mfg. Co., Com. | 1 | 600,000 | ——— | 63,000 | Yarn | 1,000 | Fine Combed Yarns, Gassed, Mercerized, Bleached and Dyed, Commercial Mercerizing. |
| Holmes Mfg. Co., Pfd. | | 600,000 | ——— | —— | —— | —— | |
| Kilburn Mills | 2 | 1,500,000 | ——— | 126,000 | Yarn | 1,200 | Combed Cotton Yarns. |
| Manomet Mills | 2 | 2,000,000 | ——— | 126,288 | Yarn | 1,400 | Combed Cotton Yarns. |
| Nashawena Mills | 2 | 3,000,000 | ——— | 125,000 | 3,400 | 1,600 | Plain and Fancy Cotton and Jacquard Silk Novelties. |
| N. B. Cotton Mill Corp., Com. | 1 | 350,000 | 475,000 | 73,000 | 1,400 | 600 | Fine Cotton Goods, plain and fancy, Dimities, Lenos, Persian Sateens. |
| N. B. Cotton Mill Corp., Pfd. | | 750,000 | ——— | —— | —— | —— | |
| Neild Mfg Corporation | 1 | 800,000 | 250,000 | 56,000 | 1,500 | 500 | Plain and Fancies, Silk and Mercerized Specialties. |
| N. E. Cotton Yarn Co. | 9 | | ——— | †303,711 | Yarn | †3,400 | Yarns of all kinds, Combed and Carded, Mercerized, Gassed, Bleached, Colored. |
| Nonquitt Spinning Co. | 2 | 2,400,000 | ——— | 140,000 | Yarn | 1,300 | Combed Cotton Yarns. |
| Page Mfg. Co. | 1 | 1,000,000 | ——— | 63,000 | 1,742 | 600 | Fancy Cotton and Silk Goods. |
| Pierce Mfg. Co. | 4 | 600,000 | ——— | 116,068 | 3,592 | 1,200 | Fancy and Fine Cotton and Silk Goods. |
| Pierce Bros. (Limited) | 1 | 700,000 | ——— | 53,000 | 1,200 | 500 | Fine Combed Yarn Cloths. |
| Potomska Mills | 3 | 1,200,000 | ——— | 116,000 | 2,600 | 1,200 | India Linons and Lawns, and Fancies. |
| Quissett Mill, Com. | 1 | 1,250,000 | 94,500 | 80,000 | Yarn | 750 | Spinners of Combed and Carded Yarns, all Plys and Descriptions, Egyptians and Sea Island Specialties. |
| Quissett Mill Pfd. | | 305,000 | ——— | —— | —— | —— | |
| Sharp Mfg. Co., Com. | 1 | 900,000 | ——— | 100,000 | Yarn | 800 | Fine Combed Yarns. |
| Sharp Mfg. Co., Pfd. | | 600,000 | ——— | —— | —— | —— | |
| Soule Mill | 1 | 1,260,000 | ——— | 93,000 | 2,300 | 900 | Lawns, Dimities, Lenos. |
| Taber Mill | 2 | 1,300,000 | ——— | 70,720 | 1,800 | 700 | Fancy Goods and Lawns, Novelties in fine goods and Silks. |
| Wamsutta Mills | 8 | 3,000,000 | ——— | 230,000 | 4,300 | 2,200 | Bleached and Brown Sheetings, Shirtings, Lawns, Sateens and Yarns. |
| Whitman Mills | 2 | 2,000,000 | ——— | 165,000 | 4,932 | 2,000 | Finest Plain and Fancy Cotton Goods; also Cotton and Silk Mixtures. |
| | 65 | $39,725,000 | $2,119,500 | 3,014,851 | 53,733 | 32,120 | |

†In mills located in New Bedford.

## Annual Review of the Fall River Mill Stock Market.

BY G. M. HAFFARDS AND CO.

A general hardening of prices for stocks has characterized the Fall River market for the year 1915. The basis for this has not been so much from the effect of legitimate profits in the business itself, as a reflex from the abnormal profits made in other lines of manufacturing through war necessities.

The year in manufacturing has been a peculiar one and cotton has played an important part in the make-up of accounts. Those mills who started in with cheap cotton or who purchased on the breaks in prices show good results, while those who purchased simply to cover requirements made but an indifferent showing.

Relatively, there has been more profit in the finer class of goods and specialties; the coarser goods mills making somewhat disappointing showings, although with an improving tone at the present time. The mills as a rule have earned their dividends, while in the case of the finer goods plants, they have either decreased their debt or increased their surplus accounts to a material degree.

There has been no accumulation of goods, the demand being quite equal to the supply. The comparatively small profits together with the engagement of the cotton machinery plants in other directions, has conspired to prevent any extension in our local concerns, either in the shape of new mills or additions; but there has been an increase of nearly 1,000,000 spindles in the country at large.

An average advance of $15 per share has taken place in the price of Fall River stocks with few offerings, which condition has ruled during the year. The dividend record, however, shows only an average of not quite 4 per cent.

Competition of southern made goods (manufactured by cheaper labor and longer hours) has been an important and growing factor and has tended to check rising prices several times. Labor has remained stationary, the general manufacturing situation hardly encouraging any advance but it is to be hoped that this may change so as to warrant increased disbursements in this direction.

The Barnaby Mfg. Co., manufacturers of ginghams, etc., have suspended operation during the year and we have taken no account of their spindles in the tabulation. We give herewith a summary of the results of the year's work:

FALL RIVER MANUFACTURING STATISTICS COMPILED BY G. M. HAFFARDS AND CO.

| | CORPORATIONS | Par Value | Capital | Amount | and When Paid | | | Total 1915---1914 | | No. of Spindles | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Nov. 1 | 1 | 0 | 94,525 | 1 |
| 2 | Ancona Co. | 100 | 300,000A | Jan. 1½ | April 1½ | July 1½ | Oct. 0 | 4½ | 6 | 40,080 | 2 |
| 3 | Arkwright Mills | 100 | 450,000 | | | | | 0 | 6 | 68,432 | 3 |
| 4 | Barnard Mfg. Co. | 100 | 500,000 | | | | | 0 | 0 | 80,304 | 4 |
| 5 | Bourne Mills | 100 | 1,000,000 | Feb. 1½ | May 1½ | Aug. 1½ | Nov. 1½ | 6 | 6 | 91,258 | 5 |
| 6 | Border City Mfg. Co. | 100 | 1,000,000 | Feb. 1 | May 1 | Aug. 1 | Nov 1 | 4 | 4 | 121,928 | 6 |
| 7 | Barnaby Mfg. Co. | 100 | Not in | operation | | | | | | | 7 |
| 8 | Chace Mills | 100 | 1,200,000 | Jan. 1½ | April 1½ | July 1½ | Oct. 1½ | 6 | 6 | 116,688 | 8 |
| 9 | Charlton Mills | 100 | 800,000 | | | Aug. 1 | Nov. 1 | 2 | 0 | 52,992 | 9 |
| 10 | Cornell Mills | 100 | 400,000 | Jan. 2 | April 2 | July 2 | Oct. 2 | 8 | 8 | 45,040 | 10 |
| 11 | Conanicut Mills | 100 | 300,000C | Jan. 0 | April 0 | July 1 | Oct. 1 | 2 | 4 | 29,412 | 11 |
| 12 | Davis Mills | 100 | 1,250,000 | Jan. 1½ | April 1½ | July 1½ | Oct. 1½ | 6 | 6 | 130,368 | 12 |
| 13 | Davol Mills | 100 | 500,000 | Jan. 1½ | April 1½ | July 1½ | Oct. 1½ | 6 | 6 | 45,264 | 13 |
| 14 | Flint Mills | 100 | 1,100,000 | Jan. 1½ | April 1½ | July 1½ | Oct. 1½ | 6 | 6 | 107,000 | 14 |
| 15 | Granite Mills | 100 | 1,000,000 | | | | Nov. 1 | 1 | 1 | 122,048 | 15 |
| 16 | Hargraves Mills | 100 | 800,000 | | | | | 0 | 0 | 115,874 | 16 |
| 17 | King Philip Mills | 100 | 1,500,000 | Jan. 1½ | April 1½ | July 1½ | Oct. 1½ | 6 | 6 | 135,232 | 17 |
| 18 | Laurel Lake Mills | 100 | 600,000 | | | | Nov. 1 | 1 | 3½ | 60,464 | 18 |
| 19 | Lincoln Mfg. Co. | 100 | 1,250,000 | | | | Oct. 1½ | 1½ | 0 | 105,000 | 19 |
| 20 | Luther Mfg. Co. | 100 | 525,000 | Feb. 1½ | May 1½ | Aug. 1½ | Nov. 2 | 6½ | 6 | 52,048 | 20 |
| 21 | Merchants Mfg. Co. | 100 | 1,200,000 | Feb. 1 | May 1 | Aug. 1 | Nov. 2 | 5 | 4 | 131,496 | 21 |
| 22 | Massasoit Mfg. Co. | 100 | 500,000F | | | | | 6 | 6 | | 22 |
| 23 | Mechanics Mills | 100 | 750,000 | Jan. 1 | April 1 | July 1 | Nov. 1 | 4 | 4 | 60,496 | 23 |
| 24 | Narragansett Mills | 100 | 400,000 | | April 1 | July 1 | Oct. 1 | 3 | 4 | 54,192 | 24 |
| 25 | Osborn Mills | 100 | 750,000 | Jan. 1 | April 1 | July 1 | Oct. 1 | 4 | 6 | 70,332 | 25 |
| 26 | Parker Mills | 100 | 800,000 | | | | | 0 | 0 | 111,684 | 26 |
| 27 | Pilgrim Mills | 100 | 1,050,000D | | April 1½ | July 1½ | Oct. 1½ | 4½ | 6 | 53,568 | 27 |
| 28 | Pocasset Mfg. Co. | 100 | 1,200,000 | | | | Dec. 1 | 1 | 2½ | 123,010 | 28 |
| 29 | Richard Borden Mfg. Co. | 100 | 1,000,000 | Jan. 3 | April 1½ | July 1½ | Oct. 1½ | 7½ | 8½ | 102,288 | 29 |
| 30 | Sagamore Mfg. Co. | 100 | 1,200,000 | Feb. 2 | May 2 | Aug. 2 | Nov. 4 | 10 | 10 | 150,200 | 30 |
| 31 | Seaconnet Mills | 100 | 600,000 | | | | | 0 | 2 | 68,384 | 31 |
| 32 | Shove Mills | 100 | 550,000 | Feb. 1 | May 1 | Aug. 1 | Nov. 1 | 4 | 4¾ | 77,728 | 32 |
| 33 | Stafford Mills | 100 | 1,000,000 | | | | | 0 | 2 | 114,584 | 33 |
| 34 | Stevens Mfg. Co. | 100 | 700,000 | Jan. 1½ | April 1½ | July 1½ | Oct. 1½ | 6 | 6 | E | 34 |
| 35 | Tecumseh Mills | 100 | 750,000 | Jan. 1½ | April 1½ | July 1½ | Oct. 1½ | 6 | 6 | 78,960 | 35 |
| 36 | Troy C. & W. Mf'y. | 500 | 300,000 | Feb. 2 | May 2 | Aug. 2 | Nov. 2 | 8 | 8 | 52,444 | 36 |
| 37 | Union Cotton Mfg. Co. | 100 | 1,200,000 | Feb. 1½ | May 1½ | Aug. 1½ | Nov. 1½ | 6 | 6 | 110,496 | 37 |
| 38 | Wampanoag Mills | 100 | 750,000 | | | | | 0 | 2 | 84,760 | 38 |
| 39 | Weetamoe Mills | 100 | 500,000 | Jan. 0 | April 1 | July 1 | Oct. 1 | 3 | 4 | 46,368 | 39 |
| | | | $30,535,000 | | | | | | | 3,104,950 | |

A—$100,000 Pfd. $200,000 Common. Dividends paid on Pfd. Stock only.
C—Authorized Capital. Dividends paid on $251,700.
D—$350,000 Pfd., and $700,000 Common. Dividends paid on Pfd. Stock only.
E—Equivalent to 63,000 Print Cloth Spindles.
F—Not included in figuring average dividend.

Total dividends paid in 1915.....$1,141,750
Total dividends paid in 1914..... 1,225,793

Decrease for the year of .....$ 84,034
And an average of 3.92 per cent.

Scotch size or kleister is an old preparation, well known to the majority of cotton manufacturers, on account of the general satisfaction it has always given. It is prepared by the Arabol Mfg. Co., 100 William Street, New York, as a binder for both fine and coarse counts as it combines readily with any starches, lays the surface fiber and holds the size well on the yarn. Manufacturers of exports and denims find it specially valuable, as it reduces shedding and loom waste to a minimum. Raw tallow or soluble tallow should be used in addition.

Write for formula to the manufacturers or to Cameron MacRae, southern sales agents, Charlotte, N. C.

The interests of the Morse Chain Co., of Ithaca, N. Y., for the territory including the states of North and South Carolina, will hereafter be taken care of by G. W. Pritchett, with headquarters at 805 Ashboro Street, Greensboro, N. C.

Mr. Pritchett is an experienced salesman of machinery and an engineer of good repute. With these qualifications, and with his wide circle of personal acquaintances among the mill owners and in the engineering profession of the South, Mr. Pritchett will add a strong link in the ever-widening organization of the Morse Chain Co.

# Mill Conditions and Market Reviews.

## Southern Mill Situation.

The new year finds southern cotton mills continuing a campaign of "preparedness" which was inaugurated the last few months of 1915, for the rapid strides of prosperity during 1916. Many old mills are undergoing systematic replenishing, overhauling old machinery, making additions of new and general revamping and tuning up, in addition to a number of new mills outright. The outlook from an industrial and financial standpoint is most promising, and should the new Congress show a disposition to conservative action, as now seems probable, the present business revival may continue unchecked for some time. A number of mill men talked with, state that a tremendous volume of business is being done in most sections, and the upward movement is spreading to nearly all industries. The door of opportunity has been opened wider than ever to American enterprise by the unfortunate but temporary crippling of foreign manufacturers, and it would seem that our manufacturers are taking advantage of this opportunity to the fullest extent.

Talking with B. D. HEATH, president of the Newton Cotton Mills, at Newton, N. C., and president of the Manetta Mills, Lando, S. C., about present conditions, he said that the outlook for the mill business in this country is good, due in part to the fact that the mills in the old countries are put to such an enormous expense at this time, in transporting American cotton on account of the exorbitant freight rates prevailing over there. He states that this high cost of transportation of raw material practically eliminate competition from them with American mills, both for domestic and foreign trade. Mr. Heath thinks that conditions in this country will continue to be favorable to cotton manufacturers as long as the war lasts, and by the time it is over will have established such strong connecnections with South American and other countries that we will have a firm foothold.

Asked his opinion on "Preparedness" he said, "My idea of preparedness is that we should have a strong navy and sufficient coast defences, but not much increase in the way of a standing army. We are situated unlike any of the old countries from the fact that we are about 3,000 miles away from the Eastern Hemisphere. It would take soldiers from any of the old countries some time to get to us, and then the expense is to be taken into consideration. If we had a strong navy we would have ample time to mobilize a strong army before they could reach us."

Morehead Jones of the Defiance Sock Mills at Charlotte, N. C., reports that the dye proposition is a serious question with his firm. He has just moved his plant into the new mill, which is a nice two-story brick building. Incidentally, he has 1200 pounds of 16's hosiery yarn, dyed with sulphur black, which he will exchange for coarser numbers of yarn in black or for logwood or aniline dye.

The Lineberger string of mills at Belmont, N. C., are reported as doing a fine business and building several new operatives' houses in addition to equipping the village of the National Mills with a new sewage system. The interests that control these four mills at Belmont are intending to build a new mill of 21,000 spindles capacity. This mill will have a capital stock of $300,000 and will make combed yarn. Work on this mill will be begun probably some time this month.

The C. W. Johnson Mfg. Co., at Charlotte, N. C., has recently installed a new cleaning system.

The Highland Park Mill No. 3 at Charlotte, N. C., is building a new dye house 50 x 150 feet and will install two raw-stock dyeing machines and one double-deck drying machine which they have purchased from the Charlotte Dyeing Mach. Co. It is reported that they have also secured 50,000 pounds of dyestuff.

The Robinson Mfg. Co., of Charlotte, N. C., is installing 4,000 new Fales and Jenks tape driven spindles and other accompanying machinery which is of Woonsocket make. Five Foster winders are included in this equipment.

The Rolin Mfg. Co., at Lincolnton, N. C., report business good and expect to start night work shortly. They have plenty of orders.

The Elm Grove Cotton Mills at Linconton, N. C., recently added two ball warpers to their equipment.

The Ivey Mill at Hickory, N. C., report a good business. They have recently repainted the mill village and installed a sanitary drinking fountain system in the mill.

C. Sherman Grove, proprietor of the Best Knitting Mills at Hickory, N. C., reports a good business. This mill has recently purchased a number of Scott & Williams knitting machines.

The new mill at Granite Falls, N. C., which will make 30's combed hosiery yarn is about one half finished. It will be an up-to-date mill in every respect. It is to be equipped with electric drive, 6,000 Fales and Jenks spindles, Heatherington combers, and Westinghouse motors. It is capitalized at $100,000. J. D. Elliott is president, L. T. Sharp, vice president and D. H. Warlick, secretary and treasurer. This mill expects to be ready to start in April, 1916.

The Valdese Mfg. Co., at Valdese, N. C., are doubling the capacity of the mill and adding Whitin spinning and Foster winders. A number of improvements have been made in and around the mill, among which is a new office building which will be used by this mill and also by the Waldensian Hosiery Mill. Twenty heads of Cramer air conditioning apparatus is one of the notable additions to equipment made by this company.

The Drexel (N. C.) Knitting Mill has recently installed 29 Acme knitting machines and 29 Wildman ribbers.

The Catawba Cotton Mills at Newton, N. C., have recently built several new operatives' houses.

The Shelby Cotton Mill at Shelby, N. C., has been making a number of small improvements and have recently equipped 50 Whitin Looms with filling attachments made by the Hopedale Mfg. Co.

Dr. S. S. Royster of Shelby, N. C., will build a new knitting mill, starting on it sometime in January, 1916. It will be capitalized at $100,000 and will be equipped with machinery for manufacturing 220 needle hosiery. A complete dyeing, bleaching and finishing outfit will be included

in the equipment and perhaps a small mercerizing plant. Fifty knitting machines with the other necessary machinery will be the amount first purchased. Dr. Royster is the sole owner and he intends to have a complete and up-to-date mill in every respect.

The Marion Knitting Mills at Marion, N. C., report a good business and are running full time. This plant will probably be enlarged at an early date, practically doubling its capacity. They intend to add fifty more knitting machines and other necessary equipment as well as some dyeing machinery.

The Carolina Hosiery Mill Co., at Marion, N. C., is to build an addition to the present mill in which they will equip a dye house. They are adding 18 new machines at present and expect to increase to 100 machines shortly or as soon as the new addition is finished. C. F. James is the superintendent and buyer.

The management of the Princeton Mill at Salisbury, N. C., has purchased the machinery of the old Welford Mill at Welford, S. C., which they will install in the little spinning mill at Crouse, N. C., which they have also purchased. This mill at Crouse has been closed down for some time, but is now being put in order and will probably be in running condition at an early date. It will manufacture damask as does the Princeton Mill.

The Young-Hartsell Mills at Concord, N. C., have recently added 17 Whitin cards, one finisher and one breaker picker of Kitson make, three intermediates, five fly frames and eight drawing frames of Woonsocket manufacture. They have also built eight new operatives' houses in the village and are doing a great deal of general repair work.

The Taylorsville (N. C.) Cotton Mill has recently installed a 350 h.p. Filer & Stowell engine. They are also building a large warehouse.

The Josephine and Wahneta mills, of Cedartown, Ga., were to be sold at auction according to an announcement made just as this issue of COTTON goes to press, by Charles S. Austin, of the Joseph P. Day Real Estate company, of New York city, which concern has been appointed to dispose of these mills.

With the arrival and installation of new machinery in the addition to Crown Cotton mill No. 2, at Dalton, Ga., the mills are steadily adding to their force of employees. Several new streets have been opened and many new cottages have been completed, and others are being built. The site for a number of new cottages at the foot of Mt. Rachel has been selected, and these cottages also are going up rapidly. The mills have also had constructed about one mile of cement sidewalks which give the employes a dry route in going to and from the mills. The improvement is a decided one.

The Pioneer Mills, Guthrie, Okla., plan the installation of a weaving and knitting department. J. E. Douglass is president.

The Glenola Cotton Mills, Eufaula, Ala., have announced that they will begin operations the first of the year, after having been closed down for some time. H. H. Connor is president. They have an equipment of 5,616 spindles and 148 looms operating on shirting and sheeting.

The Howell Mfg. Co., Cherryville, N. C., is planning to double its capacity, making the mill a 5,000 spindle plant.

An installation of 2,586 new looms is being made at the three Langley, South Carolina, mills, these being at Langley, Bath and Clearwater, S. C., this new equipment replacing old machinery. These mills have done a large amount of overhauling and repairing during the past summer.

At Shelbyville, Tenn., operations are to be started in January on a new knitting mill to be established by the Robinson-McGill Mfg. Co., manufacturers of harnesses, collars, etc. The new plant will manufacture men's ribbed union suits, with an equipment of about 12 knitting machines and 35 sewing machines. The mill and dyehouse will be operated by electric power.

A new cotton mill company, under the name of the Eastern Mills Company, with a capital of $500,000, will soon be in operation at Hope Mills, N. C., to take the place of the plants of the Hope Mills Mfg. Co., recently sold at auction. John F. McNair, of Laurenburg, is president of the new company, and W. J. Beattie is to be managing director and resident officer. R. C. Biberstein of Charlotte has been employed as engineer. The mills will be re-equipped with new and modern machinery, and it is expected that all of this work will be completed and the mills ready to start up within the next two or three months.

A new cotton mill is to be built at Statesville, N. C., by T. D. Miller and J. W. Kaneer, who have been treasurer and superintendent, respectively, of the Statesville Cotton Mills. The building will be erected in the spring, and the plant will be operated to manufacture specialty knitting yarns for sweaters, underwear and hose. The capacity of the mill will be 30,000 pounds per week, and it is to be known as the Millneer Cotton Mills.

A new mill is to be built at Clover, S. C., by the Clover Cotton Mfg. Co. A $200,000 company is to be organized to build the mill, which will manufacture medium count yarns. Plans and specifications are being prepared. M. L. Smith is the man in charge.

Rome Hosiery Mills, Rome, Ga., will build an addition, and install machinery for production of aniline or oxydized black hosiery. They have placed orders for equipment.

G. H. Miller of Chattanooga and A. G. Thatcher of Philadelphia and associates will build a cotton mill to manufacture fine yarns from Sea Island cotton. They plan an equipment of 15,000 spindles and accompanying machinery, with capital of $250,000.

Sand Springs Cotton Mill is the name of a new mill to be built at Sand Springs, Okla., by Chas. Page and others. They plan a capital stock of $500,000.

Eagle & Phenix Mills, Columbus, Ga., will install 374 automatic looms, replacing that number of old looms. Contracts have been placed with Draper Company and Crompton & Knowles Loom Works.

In connection with other improvements and additions at the German-American Co.'s mill, Draper, N. C., they are planning to add 75 looms for weaving blankets.

Little Rock (Ark.) Pickery & Spinning Co. will build plant for cotton linters. C. C. Cavanaugh is president; Geo. C. McCardell, treasurer, and J. N. McNamara, superintendent.

The Abingdon Mills, Huntsville, Ala., will erect new addition and install 5,000 new spindles, with accompanying machinery. The Merrimack Mills, of the same town, will also add new spinning.

The Tuckaseege Mfg. Co., Holly Mount, N. C., is considering the installation of new machinery to increase their

output of yarns. An equipment of 5,000 spindles is operated at present on 16's single, 16's 2-ply, 20's 2-ply warps and 20's single warps and skeins. H. A. Ryne is secretary and treasurer.

The Fairfax Mill of the West Point Mfg. Co., located at Fairfax, Ala., has placed an order for a complete equipment of waste machinery for their new mill. The Fairfax Mill will make cotton duck, and is one of the largest new cotton mills now under construction in the South. The installation of machinery is expected to begin in February, 1916, and is to come from the Saco-Lowell Shops. The waste equipment will be furnished by English builders.

New machinery for enlarging their plant has been purchased by the Lane Mills, New Orleans. S. Odenheimer is president of this corporation.

The Mooresville Cotton Mills, Mooresville, N. C., have closed an order for 125 Stafford automatic looms.

The Cardinal Mills, West Point, Miss., have made made arrangements for doubling their output. They manufacture hosiery yarns, 30's and 40's, and supply yarns in cones, warps and tubes, single or 2-ply. Demand for their goods has been very active recently.

H. P. Smith, of Keener, Ala., is interested in the establishment of a cotton mill at Alabama City. He hopes to have this in operation some time during the next year.

## New England Mill Situation.

New England cotton mills are as fully employed as they can be, their operations being restricted only by the scarcity of dyestuffs, and the growing scarcity of labor. There are no signs of labor discontent beyond the usual preparations that are under way in trade union circles for work upon the incoming legislatures. Expectations of trouble in the spring are entertained by some manufacturers and they are inclined to be cautious in booking very late orders unless prices are on a higher level than those obtaining for spot cash or nearby goods. That a demand for higher wages is probable admits of little questioning, as the influence of activity in all labor circles, especially in ammunition factories, is expected to reach the cotton mills later on.

Costs of production have been advancing greatly in consequence of the high costs of dyes, drugs, chemicals, and other mill supplies. During the past month this has been impressed upon selling agents in New York and they are advancing prices and revising many price lists in an upward direction. The mills are beginning to resume normal dividends in many centres but the complaint is general that profits are limited owing to the difficulty of getting selling prices to a parity with costs. The fact that the current cotton crop is 30 per cent in volume less than the last crop has been discounted to some extent in the rise in price to around 12½ cents from a low of 7.90 on the opening days of the year. The mills did not get normal benefits from this rise as selling agents were unable until the last quarter of the year to move values up to a profitable level.

The fine goods industry continues to be the particular bright spot and it is in strong contrast with the conditions in print cloth mills and in mills making any sort of dyed product.

The mills making napped goods are preparing to name their prices for the new fall season. The largest mills have decided that buyers must forego expectations of price making for the new season based upon established price ranges for retailing or jobbing, especially in goods where dark colors are used. To use the English mill expression, these napped cottons "sop up" dyes very fast, and selling agents are being advised that any orders for dark goods will be taken subject to the added cost of the dyes, without regard to the cost of production that apply to the lighter colored fabrics. This will make dark flannelettes and blankets cost at least ten per cent higher than the light colored goods and some agents say the prices will be at least that much higher.

The large colored goods mills are still running short time to conserve their dyestuffs. About two-thirds of the output of the cotton goods department of the Amoskeag Company is the best that has been done for several weeks and there is little prospect at this time that there will be any increase in the near future. The prices that are now being asked are much higher than a month ago. For example, staple ginghams have been advanced to 6¾ cents and the goods were placed at value about the middle of the month. Fancy tickings were advanced ½ cent a yard higher than the relative price for staples. Orders for many special fabrics are being taken at prices that are out of all range with normal values. Some Amoskeag indigo blue denims were bought by one buyer at 27½ cents a yard, the normal price with cotton at its present level being about 17 cents a yard.

The policy of asking buyers to pay the costs of the dyes in addition to the increased costs of the goods is being followed in some other colored goods mills. Where the users of the goods have established certain lines of ready to wear merchandise they cannot afford to take chances with goods whose colors are not fast.

There have been many calls for colored goods, especially yarn dyed fancies of various sorts that mills could not meet owing to the inability to get the dyes required. In recent years the process of bleaching after dyeing has become so common that the fastness of the dyes was unappreciated. The scarcity of coal tar products that will stand the bleaching process has caused a great disorganization in many plants and has increased the costs of dyeing greatly. In some instances it is necessary to take three and four times as long as usual in setting the colors used and this all adds to the cost of the goods.

Bleacheries have been unusually busy this year. Bleached cottons were advancing during the month to a basis of 8½ cents for Fruit of the Loom 4-4 goods, and 8 cents for Hills and Lonsdales. Wide sheetings have been advanced to the basis of 32½ cents for Pequot 10-4 goods and 26 cents for Pepperels. There has been a steady call for linons, nainsooks, and longcloths, and a better call for the finer grades of lawns than has been noted in some time. Rhode Island mills are busier on cloths of this description than they have been for some years.

Prints have sold better this year than in four or five years past and some departments of the Algonquin and American Printing Companies at Fall River have been running overtime. The export trade has been excellent and many orders are still to be filled for staples to be used in this country. Algonquin indigo prints were advanced to

a basis of 6 cents a yard, and the same price is asked for black prints.

Print cloths have not been satisfactory in price but sales have been sufficient to keep stocks down. Fall River is carrying about 1,400,000 pieces of odd goods of print cloth yarn construction, the staple numbers being in light stock. Prices for print cloths were not relatively as good as the prices on goods made from the coarser or the finer warps. The medium counts such as 5-yard 96 x 100's have brought premiums for spot delivery.

The fine combed yarn cloths have advanced steadily in price and mills have substantial orders on the books. Trade in New Bedford goods has been better than at any time in six years, the recovery of business in that centre being of a most remarkable character. A great many high cost fancy goods were made in sample pieces early in the year and the repeat orders on these goods have been very full. Voiles in plain and fancy weaves, piques, marquisettes, soisettes, and many varieties of colored yarn fancies have been ordered liberally and some mills are now so closely sold that they will not give new deliveries to begin earlier than March and April.

The interest in open price methods of selling goods referred to last month continues to grow among manufacturers. There is no desire to bring the development to public attention for the reason that work in forming the associations must, of necessity, be very slow and difficult. Progress is being made in some centres in a greater degree than is commonly supposed, but manufacturers do not care to talk about it just at this time. In New Bedford a half-dozen manufacturers have decided to work out the problem, if they do it, with no assistance from others. In Fall River, some of the manufacturers have taken the matter up and are discussing it with a view of trying it out in a limited way.

It has already been developed that many far-seeing manufacturers are determined to see if some plan cannot be worked out that will change the effects of the inter-mill competition on similar goods, which does not benefit consumers ultimately and only serves to dissipate profits among many middlemen, without accomplishing the service that is required in successful selling. There is no disposition manifested to criticise or to abandon present methods until it has been determined positively what the new system offers and the only positive effect of the agitation of the subject thus far has been a growing realization that cooperation among manufacturers is essential before any impression can be made among merchants who sell their product.

Generally speaking the finishers and bleachers are well supplied with orders. The only exceptions are found among those who have run short of colors or of necessary drugs and chemicals and who do not feel that it is safe to buy more until the trade is ready to pay. The white goods finishers are to install new price lists beginning January 1. The finishers and printers to the trade are advancing prices every week. Piece dyeing has been advanced until it costs 4 cents a yard to finish some piques and reps, while some finishers are asking 6 cents a yard for dyeing and finishing certain shades of mercerized poplins. The converters have ceased to find fault with the finishers for asking fair prices for their work but they are not placing orders because they are uncertain whether they can get their money back in the advanced prices for the finished goods they must sell.

Business with the machinery manufacturers could hardly be better. The Draper Company has more automatic looms on order than ever before in its history. The Saco-Lowell Shops is stated to have all the business in hand that it can take care of the first half of next year. The American Machine Company at Pawtucket is working as many men as it can hire. The Whitin works are busier than they have been in years. The Mason works are very busy. The cost of machinery has advanced considerably in the past three months following the great advances in iron, steel, and labor.

Looking forward, many manufacturers in this section are inclined to anticipate a very full business right into the spring. A presidential election coming on may halt trade somewhat, they think, later in the summer. But the constantly increasing domestic demands supplementing the restricted imports and the expanding exports, must ultimately control the prospects for mills, and just at this time the demand for goods has run beyond the place where cotton value affects it. Goods promise to be scarce, especially in colored lines, and ultimately the limited supply will enhance the possibility of profit for the mills.

## The Yarn Market.

The Philadelphia yarn market opened the month of December with a rush. There were plenty of inquiries for both weaving and knitting yarns for prompt and future delivery and some of the contracts were of a good size. However, there still seems to be a difference of opinion between the buyers and spinners on the standpoint of price, and therefore, many of the yarn dealers were unable to accept offers for fair sized quantities of yarn. Yarn receipts from the South were plentiful and deliveries good. Combed yarn spinners seem to be in a very secure position for a number of months, at least, and are complete masters of the situation. Prices of two-ply yarns were high and were expected to go higher. The demand for single combed yarns in coarse and medium counts was not very large in the Philadelphia market at this time as the hosiery and underwear manufacturers seemed to be well covered or at least they were buying in small quantities. There was a good demand for weaving yarns during this period.

Later in the month it was remarked that while December is usually a quiet month in the yarn market the conditions continued good and were considerably better than the average year. A good many spinners of fine two-ply combed yarns were reported refusing business for deliveries before March and April at their own prices. The demand for lisle and mercerized yarns was growing and there were inquiries in the market for 20,000 to 50,000 pounds of various numbers ranging from 30's two-ply to 90's two-ply. This increased demand was attributed to the high prices for artificial silk which is no longer much of a factor in the hosiery trade owing to its scarcity. Southern spinners quoted lisle yarn from 54 to 60 cents on 60's two-ply and it was freely predicted that both lisle and mercerized yarns were going higher. There was a wide range in quotations, but this was attributed to variations in quality.

There are good inquiries in the market for carded knitting yarns, but the downward tendency in prices in the cotton future market has checked buying for future deliveries to some extent. The weaving mills continue to be reported

as doing a fair volume of business, but in some lines the dye-stuff situation is restricting the kind and amount of goods turned out. There is a fair demand for 2-ply weaving yarn and prices are reasonable on the numbers most in demand. Demands for single warps continue slow.

As the market closed for the holidays the conditions of the middle of the month were prevailing and spinners' prospects bright. Following are recent quotations:

**Southern Single Skeins.**

| | | | |
|---|---|---|---|
| 8s | 18 @19 | 24s | 22½ |
| 10s | 19 @19½ | 26s | 24 |
| 14s | 20 | 26s | 23½@24 |
| 16s | 20½@21 | 30s | 27½ |
| 20s | 22 @22½ | | |

**Southern Single Warps.**

| | | | |
|---|---|---|---|
| 8s | 18½@19 | 24s | 24 |
| 10s | 19 @19½ | 26s | 24 @24½ |
| 12s | 19½@20 | 30s | 28 |
| 14s | 20 @20½ | 40s | 35 @37 |
| 16s | 20½@21 | 50s | 42 @44 |
| 20s | 21½@22 | | |

**Carpet and Upholstery Yarns in Skeins.**

| | | | |
|---|---|---|---|
| 8-4 slack | 18½@19 | 9-4 slack | 19 @19½ |
| 8-3-4 hard twist | 18 @18½ | | |

**Southern Two-Ply Skeins.**

| | | | |
|---|---|---|---|
| 8s | 18½@19 | 20s | 22½ |
| 10s | 19½@20 | 24s | 24½@25 |
| 12s | 20 @20½ | 26s | 25½@26 |
| 14s | 21 @21½ | 30s | 27½ |
| 16s | 21 @22 | 40s | 35 @38 |

**Southern Two-Ply Warps.**

| | | | |
|---|---|---|---|
| 8s | 19 @19½ | 24s | 24½@25 |
| 10s | 20½@21 | 26s | 25 @25½ |
| 12s | 21½ | 30s | 28½ |
| 14s | 21½@22 | 40s | 34½@38 |
| 16s | 22 @22½ | 50s | 43 @46 |
| 20s | 23 @23½ | | |

**Northern Two-Ply Carded Peeler Skeins.**

| | | | |
|---|---|---|---|
| 22s | 25½@26 | 36s | 32 @34 |
| 26s | 27 @27½ | 40s | 36 @39 |
| 30s | 29 @29½ | 50s | 44 @46 |

**Two-Ply Combed Peeler Skeins.**

| | | | |
|---|---|---|---|
| 20s | 28 @28½ | 50s | 48 @51 |
| 24s | 30 @32 | 60s | 55 @58 |
| 30s | 34½@38 | 70s | 63 @66 |
| 40s | 41 @45 | 80s | 70 @73 |

**Southern Frame Spun Yarn on Cones.**

| | | | |
|---|---|---|---|
| 8s | 20 | 20s | 23 @23½ |
| 10s | 20 @20½ | 22s | 23 @23½ |
| 12s | 20½@21 | 24s | 23 @24 |
| 14s | 21½@22 | 26s | 23½@24½ |
| 16s | 22 @22½ | 30s | 26 @27 |
| 18s | 22½@23 | | |

**Northern Mule Spun Carded Yarn on Cones.**

| | | | |
|---|---|---|---|
| 10s | 22½@23 | 20s | 25 @25½ |
| 12s | 23 @23½ | 24s | 26½@27 |
| 14s | 23½@24 | 26s | 27 @27½ |
| 16s | 24 @24½ | 30s | 28½@29 |
| 18s | 24½@25 | 40s | 35 @36 |

**Northern Mule Spun Combed Peeler Yarn on Cones.**

| | | | |
|---|---|---|---|
| 10s | 27½@28½ | 24s | 30½@31½ |
| 12s | 28 @29 | 26s | 31½@32 |
| 14s | 28½@29½ | 28s | 31½@32 |
| 16s | 29 @30 | 30s | 33 @34 |
| 18s | 29½@30 | 36s | 37 @39 |
| 20s | 30 @31 | 40s | 41 @43 |
| 22s | 30½@31 | | |

## Cotton Comment.

BY H. AND B. BEER, NEW ORLEANS.

The market experienced a temporary rally during the past month as a result of the large private crop estimates being refuted by the government's crop estimate issued December 10th, which indicated a yield of only 11,161,000 bales of 500 pounds gross weight exclusive of linters.

Failure of the advance to hold is attributed to the falling off in the export demand, due to the scarcity of tonnage and high ocean freight rates to European ports. At the present time there is no relief in sight, as it is said that the British admiralty has commandeered about 30 per cent of the entire tonnage of the British merchant marine, or a total of about 6,000,000 tons. This is a great drawback to the market, for while spots in the South, basis of middling, are below the 12 cents level, middling in Liverpool is 7.63d, or 15.26 cents per pound. In other words the stock in the English market is gradually decreasing owing to small imports, when, at this time of the year, it should be increasing. On the other hand stocks in the South, which should be decreasing by reason of the small crop, continue to increase for want of a foreign demand. As a result, prices abroad are almost at the highest levels reached thus far this season, whereas values in America are about one per cent, or about 100 points lower than those ruling in early October.

The sustaining feature of market on this side of the Atlantic is the large consumption by American mills. During the month of November mills of the United States consumed 593,000 bales vs. 447,000 last year, making a total for the first four months of the season of 2,249,000 against 1,779,000 one year ago, an increase of 470,000 bales. It is evident, therefore, that the consumption of cotton in America this season will reach 7,000,000 bales, or about 1,000,000 bales larger than last year's previous high record. American spinners, however, hold large stocks of raw cotton, on November 30th, 1,613,000 vs. 1,062,000 last year, but they appear to be under contract for heavy deliveries of cotton goods, and their large stocks will not last long under the circumstances.

It is an ill wind that blows nobody good, and the inability of the South to ship cotton to Europe in volume, is working into the hands of American spinners, who, while continuing to buy largely in the cotton region, are not obliged to pay high prices, which would likely be the case if there was a sufficient number of ships available to move quantities of the staple to Europe. In the meantime southern spot holders are being forced to carry large stocks at the ports and at inland points, and while there is no pressure to sell, the cost of carrying such large stocks is expensive. Nevertheless, the interior seems to be determined to hold for higher prices, and it has the advantage of ample funds for the purpose, but unless the shipping situation improves soon, it will be a difficult matter to bring about any advance of importance.

In comparison with last year, exports from all ports today were 34,000 vs. 23,000, thus far this week, 80,000 vs. 175,000, since August 1st, 2,184,000 against 2,212,000.

If the foreign demand should pick up, America could only spare about 6,500,000 bales for export this season against 8,500,000 last season. This is indicated by the small crop and last year's carry-over in the South amounting to about 14,000,000 bales, and because of America needing about 7,000,000 for home consumption and about 500,000 for port and interior stocks at the close of the season to protect the short interest in the future markets.

There is no doubt that Europe will take all the cotton we can spare this season, but in small but frequent doses, which will likely continue throughout the spring and summer, and chances are that it will not be until later in the season when higher prices will prevail.

As to prospects for the next crop, the situation is not favorable for the making of a large crop. Washington advises that the winter wheat acreage in the South has generally been increased, and advices from the country are to the effect that another large acreage is being sown in oats, while it is probable that the South will plant for another large corn crop in the spring. Mules and fertilizers will be scarce, especially German potash, which is about exhausted, and the weevils, which played such havoc with this year's crop, are reported to be more numerous and over a larger territory than ever before.

# COTTON MANUFACTURING.

## The Influence and Application of Humidity in the Processing of Cotton.

(*Continued from page 106.*)

| Dry bulb temperature; degrees Fah. | Factor | Dry bulb temperature; degrees Fah. | Factor | Dry bulb temperature; degrees Fah. | Factor |
|---|---|---|---|---|---|
| Below 24° | 8.5 | 31.32 | 3.7 | 55-60 | 1.9 |
| 24-25 | 6.9 | 32-33 | 3.3 | 60-65 | 1.8 |
| 25-26 | 6.5 | 33-34 | 3.0 | 65-70 | 1.8 |
| 26-27 | 6.1 | 34-35 | 2.8 | 70-75 | 1.7 |
| 27-28 | 5.6 | 35-40 | 2.5 | 75-80 | 1.7 |
| 28-29 | 5.1 | 40-45 | 2.2 | 80-85 | 1.6 |
| 29-30 | 4.6 | 45-50 | 2.1 | | |
| 30-31 | 4.1 | 50-55 | 2.0 | | |

The necessity for these factors is shown in the following example. The dry bulb thermometer reads at 75 degress F. and the wet bulb at 69 degreesF. It is desired to know just what relative humidity is present when the hygrometer reads at 75 degrees and 69 degrees. First subtract the reading of the wet bulb from the reading of the dry bulb, and multiply this difference by the proper factor as given in the table for the temperature registration on the dry thermometer. In this case there is a difference of 6 degrees to be multiplied by the factor 1.7 equalling 10.2 degrees. Subtract this product from the original reading of the dry thermometer and the result will be the temperature which is the saturation point of the amount of moisture present as indicated by the temperatures recorded on the hygrometer. In this case this would be 75 degrees less 10.2 degrees or 64.8 degrees, which can be called 65 degrees. Now consult a list of temperatures showing the maximum amount of moisture capable of being held at the various temperatures. It will be found that the air is capable of holding 6.82 grains of moisture per cubic foot of air at 65 degrees Fahrenheit. It will also be found that the table shows a cubic foot of air capable of holding 9.39 grains of moisture at 75 degrees. From this data, the relative humidity can be found by figuring what percentage of the maximum amount, which is 9.39 grains or 100 per cent, would be the 6.82 grains or actual amount present. 6.8 multiplied by 100 per cent and divided by 9.39 will give 72½ per cent relative humidity.

Assuming that we desire to have 80 per cent relative humidity in a certain room with the temperature at 75 degrees Fahrenheit. To determine this we must calculate what the wet bulb thermometer should register to give 80 per cent relative humidity at 75 degrees F. From the table it is found that the maximum amount of moisture capable of being held at 75 degrees F. is 9.39 grains per cubic foot of air. To have 80 per cent relative humidity then each cubic foot of air should contain 80 per cent of the maximum amount or 80/100 of 9.39 grains equalling 7.5 grains. From the same table it is found that 7.5 grains per cubic foot is the saturation point at 68 degrees F. Then 68 degrees must equal the difference between the readings on the dry and wet bulb thermometers, and the temperature of the air as shown on the dry bulb thermometer to be 75 degrees F. Then the product of the factor, and what difference is found to exist between the reading of the two thermometers which equals 7 degrees, or 68 degrees subtracted from 75 degrees. Dividing this product of 7 degrees by the factor given in Glashier's table for 75 degrees Fahrenheit, namely 1.7, the result will be 4 degrees, which is the proper difference at 75 degrees F. with 80 degrees relative humidity. Therefore the wet bulb thermometer should register at 71 degrees Fahrenheit.

There is an instrument on the market called the "Hygrodeik," which is made for the G. M. Parks Company, and by its use relative humidity, grains of moisture per cubic foot and dew point may be ascertained without the use of hygromatic tables. This instrument is shown at Fig. 2.

In 1889 the British Parliament enacted the Cotton Cloth Factories Act which fixed the maximum limits of humidity of the atmosphere at given temperatures. This law is still in force and the limits named are given herewith. The temperatures are from 60 degrees to 100 degrees Fahrenheit inclusive, and a column has also been added showing the grains of moisture per cubic foot that the air is capable of holding at the various temperatures.

| Dry Bulb | Wet Bulb | Humidity Percentage Relative | Humidity Actual in grains per ft. of air | Maximum moisture in grains per cu. ft. of air. |
|---|---|---|---|---|
| 60° | 58° | 88% | 5.1 grs. | 5.8 grs. |
| 61 | 59 | 88 | 5.2 | 5.99 |
| 62 | 60 | 88 | 5.4 | 6.14 |
| 63 | 61 | 88 | 5.6 | 6.36 |
| 64 | 62 | 88 | 5 8 | 6.6 |
| 65 | 63 | 88 | 6.0 | 6.82 |
| 66 | 64 | 88 | 6.2 | 7.05 |
| 67 | 65 | 88 | 6.4 | 7.27 |
| 68 | 66 | 88 | 6.6 | 7.5 |
| 69 | 67 | 88 | 6.9 | 7.84 |
| 70 | 68 | 88 | 7.1 | 8.07 |
| 71 | 68½ | 85.5 | 7.1 | 8.30 |
| 72 | 69 | 84 | 7.1 | 8.45 |
| 73 | 70 | 84 | 7.4 | 8.81 |
| 74 | 70½ | 81.5 | 7.4 | 9.08 |
| 75 | 71½ | 81.5 | 7.65 | 9.39 |
| 76 | 72 | 79 | 7.7 | 9.75 |
| 77 | 73 | 79 | 8.0 | 10.13 |
| 78 | 73½ | 78 | 8.0 | 10.40 |
| 79 | 74½ | 77.5 | 8.25 | 10.64 |
| 80 | 75½ | 77.5 | 8.55 | 11.03 |
| 81 | 76 | 76 | 8.6 | 11.32 |
| 82 | 76½ | 74 | 8.65 | 11.70 |
| 83 | 77½ | 74 | 8.85 | 12.00 |
| 84 | 78 | 72 | 8.9 | 12.36 |
| 85 | 79 | 72 | 9.2 | 12.78 |
| 86 | 80 | 72 | 9.5 | 13.2 |
| 87 | 80½ | 71 | 9 55 | 13.45 |
| 88 | 81½ | 71 | 9.9 | 13.94 |
| 89 | 82½ | 71 | 10.25 | 14.44 |
| 90 | 83 | 69 | 10.3 | 14.92 |
| 91 | 83½ | 68 | 10.35 | 15.20 |
| 92 | 84½ | 68 | 10.7 | 15.73 |
| 93 | 85½ | 68 | 11.0 | 16.2 |
| 94 | 86 | 66 | 11.1 | 16.82 |
| 95 | 87 | 66 | 11.5 | 17.42 |
| 96 | 88 | 66 | 11.8 | 17 8 |
| 97 | 88½ | 65.5 | 11.0 | 18.2 |
| 98 | 89 | 64 | 12.0 | 18.75 |
| 99 | 90 | 64 | 12.3 | 19.2 |
| 100 | 91 | 64 | 12.7 | 20.0 |

### METHODS AND EQUIPMENT.

The earliest methods of furnishing artificial moisture consisted of sprinkling the floors and placing water in troughs about the room. The water by evaporating, increased the moisture present in the air. This was followed by the use of steam, but this method has two very objectionable features. The steam raised the temperature of the room to such a point that the health of the operatives was impaired. The raising of the temperature also made

it more difficult to keep the proper relative humidity, as has been previously stated, air will hold more moisture at high temperature.

A satisfactory method has been universally adopted supplying the artificial moisture through humidifiers. Water, warm or cold, as desired, is forced through a feed

FIG. 2. THE HYGRODEIK.

pipe under pressure to the top of each humidifier. In the American Moistener type the water leaving the pipe strikes a projecting pin which scatters or atomizes it. The water causes a current of air to descend through the humidifier, carrying the moisture through the lower opening, directly influencing the relatives humidity within a certain radius. A drain pipe at the bottom of the humidifier carries away the surplus water. A valve on the feed pipe permits regulation of the amount of water supplied. The humidifiers are suspended from the ceiling and placed at suitable intervals. The construction of the humidifier described can be seen by the accompanying illustration Fig. 3, which shows the plain spray or induction type. This head is also made in what is known as the double outlet type which allows the spray to go in two directions only and is especially designed for card room alleys and similar places.

In Fig. 4 is shown the high duty type with motor driven fan made by the same company.

Cold water is usually supplied to the humidifiers reducing the temperature of the room, although in some cases warm water is used for the opposite purpose.

Another type of humidifier made by this same company is known as the atomizer. The spray as it leaves the jet

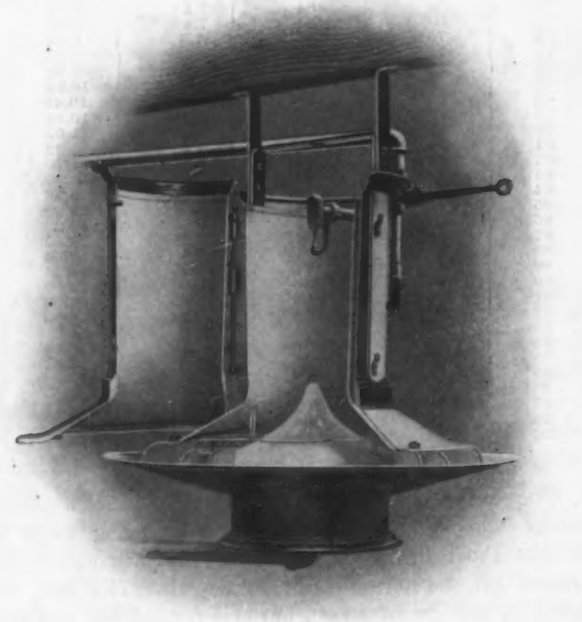


FIG. 3. AMERICAN MOISTENING CO. PLAIN SPRAY OR INDUCTION TYPE OF HEAD.

FIG. 4. AMERICAN MOISTENING CO. HIGH DUTY TYPE OF HUMIDIFIER WITH MOTOR DRIVEN FAN.

resembles the spray from the nozzle of a lawn hose. This type in its various sizes is capable of distributing from 3 to 90 pounds of water per hour operating under air pressure of from 25 to 65 pounds.

The latest improvement in humidifying systems is an automatic controller which regulates the heat and moisture. The controller, made by the American Moistening Co., is a thermostatic device, responsive to both the dry and wet bulb temperatures of the air, and is so constructed that when any pre-determined relationship of these temperatures is reached, air pressure is brought into service to operate the diaphragm valve on the water supply pipe leading to the humidifiers.

The main operating device consists of a small diaphragm valve located in the center of the controller body. This diaphragm valve is controlled by a nozzle valve, which is the real heart of the whole instrument. This latter is called the "ratio" valve, its action being controlled by the cooperation of two elements under the influence of changes in temperature and moisture. The dry element is affected by and acts in accordance with temperature changes; and the wet element is influenced by the moisture in the air. The instrument is shown in Fig. 5. The gages are placed on the apparatus merely for convenience in adjusting. The

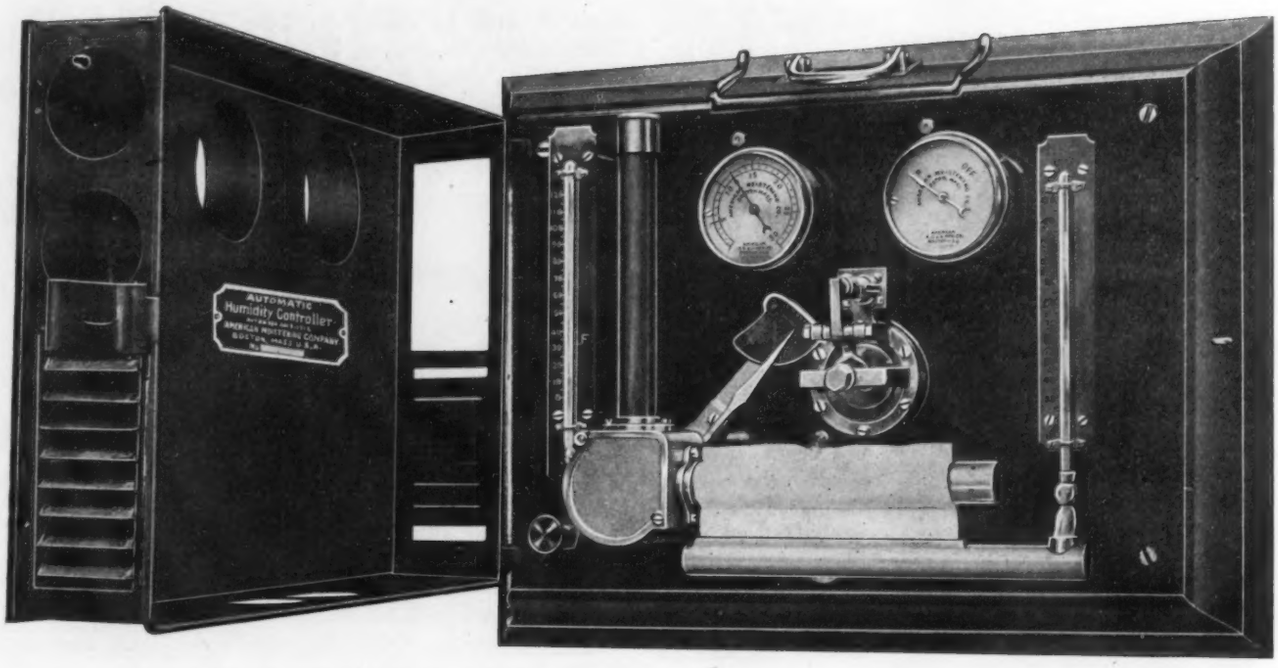



FIG. 5. AMERICAN MOISTENING CO. AUTOMATIC HUMIDITY CONTROLLER WITH DOOR OPEN.

gage on the left indicates the air pressure on the system while the one on the right shows whether the diaphragm valve on the humidity supply is open or closed, and consequently whether the humidity supply is turned "on" or "off."

The type of humidifier made by the G. M. Parks Co. should not be confused with either the injector or direct atomizer principle. It secures vaporization of the water by the application of compressed air in a tangential manner. The sectional cut of this type of head is shown at Fig. 6. Air of the required pressure is supplied at the orifice *A*; passes through the tangential orifices in the bushing *B-B*; produces a vacuum at the end of the water nozzle *E*, and by so doing, draws water through the tube *D*. The centrifugal action imparted to the air spreads the vaporized water and distributes it before condensation can occur. Fig. 7 illustrates this type of head in action.

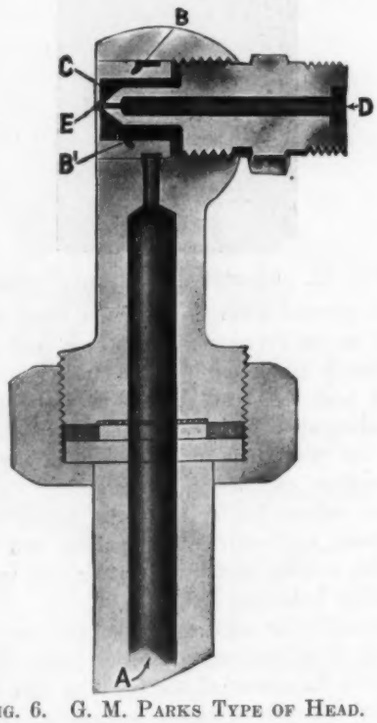



FIG. 6. G. M. PARKS TYPE OF HEAD.

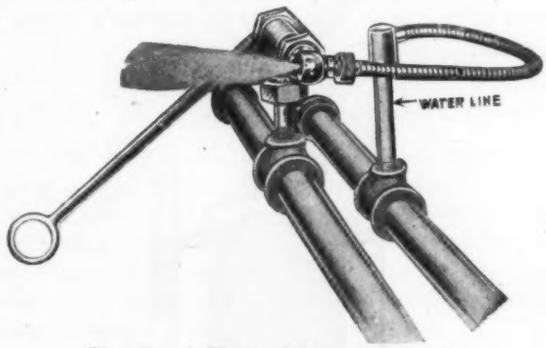



FIG. 7. A PARKS HEAD IN ACTION.

The Cramer system has several different styles of apparatus, each of which is designed for a particular purpose.

1. The central station type is one where in a single unit the air for an entire factory or room is heated in winter, cooled in summer, and moistened to the proper degree at all times. In this type, shown in Fig. 8, one or

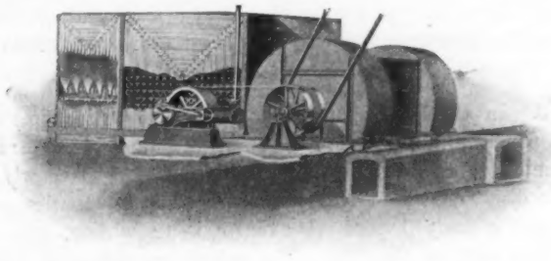


FIG. 8. THE CRAMER CENTRAL STATION TYPE.

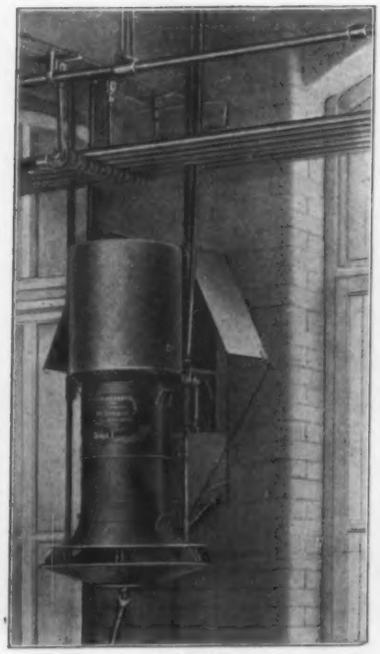


FIG. 9.

more large fans bring in fresh outside air, and after proper conditioning, all in accordance with any predetermined requirements, it is discharged into the mill room where, by automatic control, both the temperature and humidity is maintained at any desired point.

2. In proportion, on a somewhat smaller scale, the type of equipment illustrated at Fig. 9 lends itself admirably to mill conditions, as it has a direct connection through the wall to the outside air, and by means of a differential damper, any proportion of outside and inside air can be mixed and this mixture forced by a small fan in the top of the head, down through a water spray and discharged out into the room. Each equipment of this type brings into the room about 60,000 cubic feet of fresh air per hour, and a few of these heads distributed around the walls of a room will not only provide ventilation, but will also moisten the air so as to make it suitable for a variety of operations.

FIG. 10. ANOTHER CRAMER AIR CONDITIONER WITH MOTOR DRIVEN FAN.

3. In the type of air conditioner shown in Fig. 10, the fan at the top forces air through a fine water spray, cleaning it of dust, dirt and solid particles, after which it is discharged horizontally through wide flat nozzles and in such a finely divided state that it issues without drip or condensation on the floor. The cylindrical section is made in two parts which telescope on each other, and by lowering the upper section the water spray nozzle becomes easily accessible, while by raising the lower section the interior is completely opened up so as to allow cleaning.

4. In the spray type of head Fig. 11, no fan is used, the draught of air being produced by the induction of the water spray. The amount handled is naturally less than

FIG. 11. A CRAMER HEAD OF THE SPRAY TYPE.

when the fan is used. Strainers in the bottom of these heads keep a large proportion of the solid matter and dirt from going back into the drain lines.

5. The automatic humidity and temperature control of this company consists of two sensitive members which lengthen and shorten with changes in temperature. Neither of these members have any cloth covering, but one is kept moistened with a fine spray of water, and, consequently, indicates the wet bulb temperature of the air, while the other shows the dry bulb temperature. The variation or

FIG. 12. CRAMER AUTOMATIC CONTROL.

number of degrees difference between these two thermometers can be set by means of a switch, and when so set this machine is connected with the water supply to the humidifiers and the heat supply to the radiation, and these are alternately turned off and on whenever the condition of the room requires. Consequently the humidity and temperature can be kept within very close limits or any desired values, for by the mere setting of a switch, the instrument will control the humidity and temperature of the room, holding it either moist or dry, warm or cool, as the setting indicates.

The humidifying system of the Carrier Engineering Corporation is of the central station type. It is usually placed in the basement of the building and is connected to a regular fan system heating apparatus. This arrangement places the entire heating, cooling and humidifying

apparatus in one location and under the care of one operator. A typical installation is shown in Fig. 13.

The air is drawn or blown through the spray chamber of the humidifier where it comes in contact with a very minutely atomized spray of water. A large number of spray nozzles are used and evenly spaced in the chamber, insuring a uniform distribution of the mist. The mixture

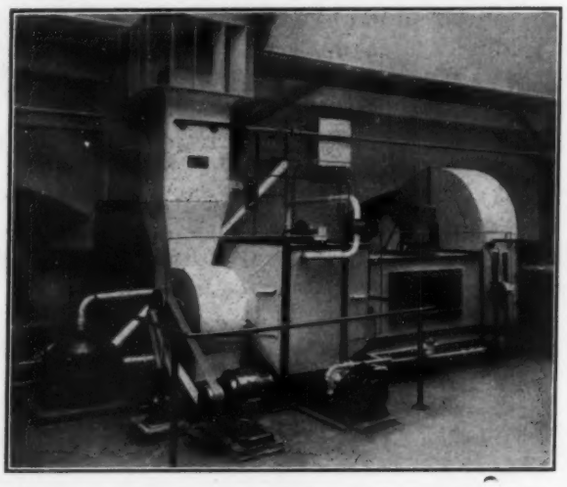


FIG. 13. A CARRIER AIR CONDITIONING INSTALLATION.

of the fine spray and the dust-laden air is very thorough, so that every particle of solid matter is made wet and heavy by the spray.

The evaporation of a portion of the spray water humidifies the air, and the amount thus evaporated depends upon the relative temperature of the water. The Carrier system provides a method of heating the water and varying its temperature to procure the humidity desired. In summer when the water is not heated, the air is cooled by one of two different methods:

First, where the same water is recirculated, the air is cooled by evaporation; that is, the heat necessary to evaporate the water is extracted from the air.

Second, the use of cold water in sufficient quantities will allow the air to be cooled and moisture condensed from it, thus lowering the humidity. Leaving the spray chamber, the air then passes through an eliminator with protruding lips which removes all free or unabsorbed moisture and solid matter; the air leaving the humidifier being clean, properly humidified and cooled.

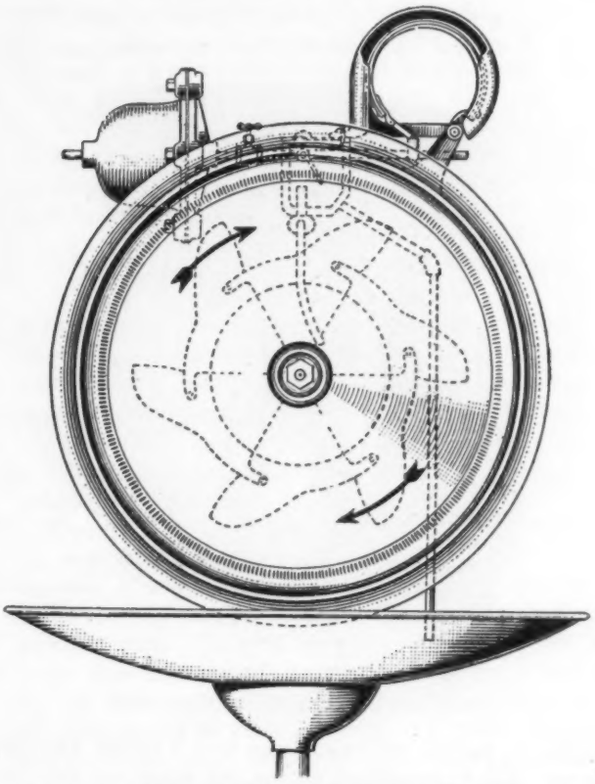


FIG. 15. FRONT VIEW OF NORMALAIR HUMIDIFIER.

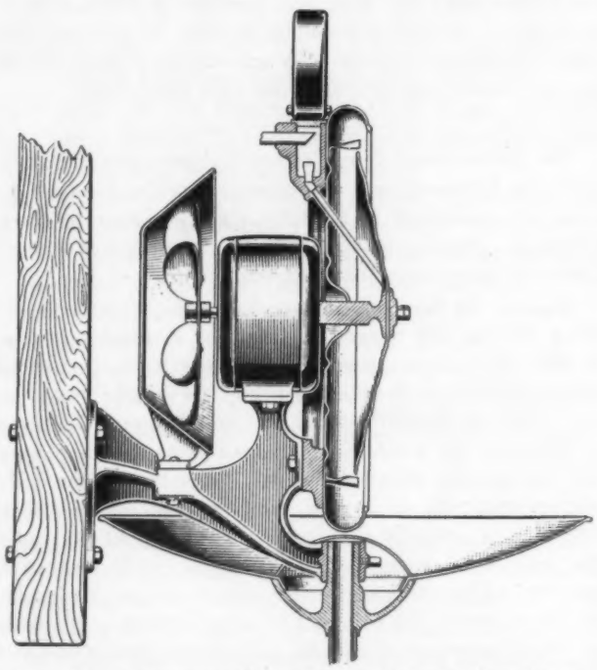


FIG. 14. SECTIONAL VIEW MOTOR DRIVEN NORMALAIR HUMIDIFIER.

The air then passes to the fan and the tempering or heating coils to be heated sufficiently to maintain the required temperature. The spray water, which is recirculated, falls from the eliminator plates to the settling tank, passes through the suction screen, thence to the ejector (where it is heated in winter) then to the pump and through a basket screen back to the sprays.

The humidifier of the Normalair Company also uses mechanical means to break up the water into a fine mist or fog. As the method used is somewhat different, however, it is worth noting. Reference to Figs. 14 and 15 will assist in the description.

The water enters from above and passes into the regulator chamber. From here, while the automatic control permits, it flows directly to the center of the rapidly revolving disk from which it is thrown by centrifugal force against the teeth of a copper grid at the circumference of the disk, where it is pulverized. All that is sufficiently fine to float around the edge of the case is caught in the blast of air from the fan and distributed. The speed of the disk is such as to give a heavy pressure on a very thin film of water, and this film strikes the teeth of the grid with sufficient force to thoroughly pulverize the water.

Behind the humidifying device is a fan, which brings a constant supply of air to the machine, forcing the evap-

oration. The fan also causes a circulation of the air in the room.

Each humidifier is equipped with an automatic humidity control to prevent the production of too much water vapor, and keep the relative humidity of the room within a few points of the desired percentage. This control is equipped with a deflector. The deflector is in the regulator chamber. When atmospheric conditions require, it deflects the entering water into the overflow.

Normalair humidifiers are mounted on the wall or columns of a room, or suspended from the ceiling, and are

NORMALAIR HUMIDIFIER IN OPERATION.

equipped with electric motors or with a pulley for belt drive. For a comparison of size, we would say that the revolving disk is about 16 inches in diameter, and the large horizontal drip pan about 24 inches.

INFLUENCE ON YARNS.

The influence of the amount of moisture on cotton yarns has been briefly mentioned in another part of this article. This influence is often lost sight of and is continually the source of frequent controversy between the buyer and manufacturer where certain strength tests and accurate counts are stipulated in the contract. The tests given herewith showing considerable variation in count and strength under varying conditions were made by the Bureau of Standards at Washington, D. C. These tests were made with the temperature at 70 degrees Fahrenheit and varying percentages of relative humidity with 65 per cent relative humidity as normal. When normal the yarn should contain 7.5 per cent of moisture.

| Yarn Count at Relative Humidity of | | | Decrease in yarn count from 45% to 85% | |
|---|---|---|---|---|
| 65% | 45% | 85% | count | per cent |
| 36.36 /1 | 36.83 /1 | 34.77 /1 | 2.06 | 5.59 |
| 49.92 /1 | 50.60 /1 | 47.79 /1 | 2.83 | 5.59 |
| 54.46 /1 | 55.20 /1 | 52.26 /1 | 2.94 | 5.32 |
| 68.82 /1 | 69.83 /1 | 65.99 /1 | 3.84 | 5.49 |
| 81.51 /1 | 82.65 /1 | 78.26 /1 | 4.39 | 5.32 |
| 19.8 /2 | 20.1 /2 | 19.2 /2 | .9 | 4.48 |
| 30.1 /2 | 30.2 /2 | 28.9 /2 | 1.3 | 4.31 |
| 39.8 /2 | 40.5 /2 | 38.9 /2 | 1.6 | 3.95 |
| 50.0 /2 | 50.5 /2 | 48.4 /2 | 2.1 | 4.16 |
| 79.2 /2 | 80.7 /2 | 77.2 /2 | 3.5 | 4.34 |

The following tensile strength tests at 55 per cent, 65 per cent, 75 per cent and 85 per cent relative humidity with a constant temperature of 70 degrees F. are an average on individual single yarns of various counts and represent several hundred tests.

| 55% | 65% | 75% | 85% |
|---|---|---|---|
| 4.29 oz. | 4.43 oz. | 4.78 oz. | 5,02 oz. |

It will be observed that the increase in strength accompanied the increase in relative humidity, and from 55 per cent to 85 per cent amounted to the increase in strength of 17 per cent. It will be noticed by comparing the table just given with the table following for two-ply yarns, that the increase is less for two-ply yarns than for single yarns, namely 17 per cent compared with 11 per cent.

Two-ply yarns with relative humidity at

| 55% | 65% | 75% | 85% |
|---|---|---|---|
| 21.13 oz. | 22.15 oz. | 22.85 oz. | 23.49 oz. |

In closing, emphasis is again laid on the importance of this subject, and every mill should determine for itself by constant observation, the conditions best suited for it.

## The Dyestuff Difficulty.

In these times of serious shortage on dyestuffs, many manufacturers are more or less inconvenienced in securing all kinds of chemical supplies. Such manufacturers will, therefore, be glad to learn that the Marden, Orth and Hastings Co., with principal offices in New York and Boston, carry a very complete line of extracts, oils and alkalies for textile mills, dye works and bleacheries. This firm is said to occupy an unusually favorable position in regard to the securing of basic and first-hand supplies which enables them to offer a very complete line of products. Their brands are well and favorably known and their facilities for undertaking contracts and offering quick deliveries are exceptionally good. They are always glad to supply samples and quotations and are frequently in a position to supply certain reliable dyestuffs, although these are naturally matters which are offered for prompt taking and subject to previous sale. They are, however, at all times glad to receive inquiries for dyestuffs as may be required and make it a special point that they only handle qualities which they are reasonably sure have not been adulterated.

The Pennsylvania Manufacturers' Association Casualty Insurance Company was incorporated at Harrisburg, October 30, capitalized at $250,000. The incorporators are Joseph R. Grundy, president of the Pennsylvania Manufacturers' Association, and others.

This is the first company to be chartered in Pennsylvania for liability insurance since the enactment of the Workmen's Compensation act. In addition to protecting its members under liability policies, the charter gives the new company general powers of insuring against damage to property by accidents or storms, and all the powers held by casualty companies under Pennsylvania laws. Its management will be in the hands of the incorporators, acting as a committee giving its services gratis. Under the articles of incorporation dividends are limited to 6 per cent on the stock investment and all other net earnings will be returned pro rata to the policy-holders in the form of annual premium dividends. It is stated that if one-half of the members of the Pennsylvania association insure with with the new company, the first year's premiums will exceed $800,000.

# Dyeing, Bleaching and Finishing.

## Principles of Beam Dyeing.

(*Continued on page 98.*)

ute) depends upon the size of the openings in the beam and the pressure exerted by the pump. With a dye solution of given strength, it is at once to be observed that the radial rate of flow of the liquor increases as it nears the center,

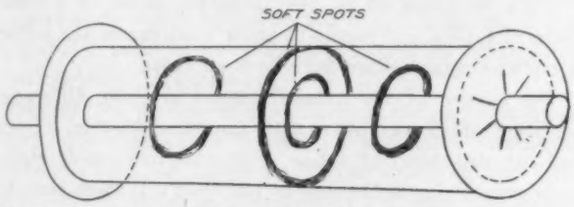



FIG. 4. BEAM SHOWING "SOFT SPOTS," IN THE FORM OF ANNULAR RINGS.

and consequently the outer laps will receive the greatest benefit from the dye, as the contact is longer. This may be illustrated in the following diagram: Fig. 6, A is a tube tightly filled with cotton. C is the dye liquor. If the liquor enters at D, it at once begins to give up the dye it contains and by the time it reaches the end B, if the

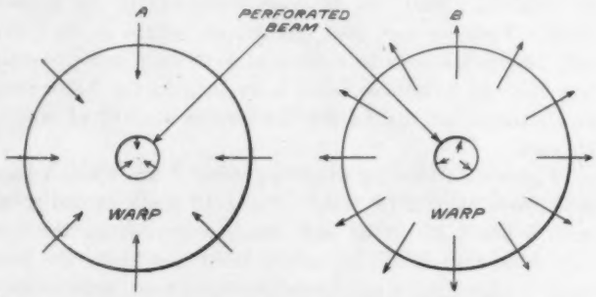



FIG. 5. STYLE A. 1. FORCING DYE LIQUOR THROUGH A WARP FROM THE OUTSIDE TOWARD THE CENTER, AND AGAINST AIR PRESSURE. 2. THE SAME, BUT AIDED BY A PARTIAL VACUUM, INDUCED BY MEANS OF A PUMP OPERATING FROM THE CENTER.

STYLE B. 1. FORCING DYE LIQUOR THROUGH A WARP RROM THE INSIDE TOWARD THE OUTSIDE, AND AGAINST AIR PRESSURE. 2. THE SAME, BUT AIDED BY A PARTIAL VACUUM, INDUCED BY MEANS OF A PUMP OPERATING FROM THE OUTSIDE.

FIG. 6.

tube is of sufficient length, the liquor will pass out colorless, the cotton taking up the color from the solution.

The mass of yarn wound on the beam between the flanges is the resistance; the greater the thickness of the wound yarn, the greater the force necessary to propel the dye liquor through; therefore it becomes a matter of interest to ascertain up to what point actual practical dyeing may proceed at pump pressures within reason.

The vat colors yield the fastest known shades upon cotton at the present time. These colors are, as a general rule, applied to cotton from strongly alkaline solutions containing, besides the dyestuffs and caustic soda, an amount of hydrosulphite of soda necessary to keep the dye stuff in a completely *chemically reduced* condition. According to the identity of certain of these vat dyes, the dyeing proceeds at a given temperature, or within certain temperature limits.

The essential point to be regarded with the vat colors is that the final shade on the dyed fabric is the result of oxidation, consequently, whatever the strength of the dye bath, so in proportion will be the fullness of the final shade.

## The Preparation of Size for Cotton Warps.

(*Continued from page 114.*)

it from acting as a siphon. This arrangement serves both as a constant level regulator and also for drawing off the size. When a number of slashers are equipped with this arrangement it is of advantage to have a pipe in the bottom of the box which connects directly with the waste pipe as this makes it possible to wash out any box without interfering with the operation of the other slashers.

The valves for connecting the supply pipes for each size box with the main supply pipe should be placed as near the main pipe as possible. This insures that the size is always moving, thus preventing it from cooling down and forming lumps. On both the main supply pipe and the return pipe there should be several steam connections so that the pipes can be thoroughly cleaned out every day. All pipes should be made of brass and where there are more than two slashers both supply and return pipes should be covered to prevent the size from cooling down.

The supply pipe for each size box should deliver the size through a wire gauze strainer. Even with the best arrangements it is impossible to prevent the formation of lumps to some extent and as lumpy or grainy size produces a harsh warp the lumps must be strained out to obtain the best results. This is particularly true in sizing warps containing waste cotton for osnaburgs, etc. There is a considerable accumulation in the size box of motes, etc., from the warp. These impurities go into the circulating system and are pumped back to the different boxes, as the amount of such impurities increases during the day they will cause serious trouble if not strained out. The strainers should be arranged so that they can be easily detached and boiled out.

The kettles, pipes and size boxes should be thoroughly cleaned out at the close of each day's run. If the size is to be kept over night or for any length of time it should be pumped back into the storage kettle where it can be kept hot. Bacteria and mildew develop very rapidly in cooked starch particularly if it is allowed to stand in the pipes or size boxes, or if the kettles are not clean and such growth causes trouble by thinning down the size, resulting in loss of starch and trouble with soft warps and also the bacteria and molds are transmitted to the warps and may cause very serious troubles on the finished cloth. Such trouble can be easily avoided by giving the necessary attention to the sizing system.

# Practical Problems Discussed by Cotton's Readers

We invite our readers to make use of this department for the discussion of any and all problems arising in the mill or the finishing plant. Questions, answers or letters need not conform to any particular style and will be properly edited before publishing. The editors do not hold themselves responsible for any statements of opinion or fact which may appear in this department unless so indorsed. This department is open to all. Suitable letters are paid for in cash.

## A Problem in Efficiency.

EDITOR COTTON:

I am submitting the following problem for the attention of the readers in your practical discussion department. It is a typical mill problem and one worthy of study.

A mill produces 20,000 pounds of cloth per week, which it is obliged to sell at a loss of ¼ cent per pound. The manufacturing cost is as follows:

Piece work per pound equals 5 cents.

Day labor per pound equals 5½ cents.

Supplies and expenses per pound equal 7½ cents.

Total, 18 cents.

If by increasing efficiency the mill increases its output 2,000 pounds weekly, and sells at the same price as formerly, will the mill gain or lose, and about how much?

L. E. R. (Massachusetts.)

## Static in Belts.

EDITOR COTTON:

Static electricity in textile mill belts can usually be avoided by treating the belt in such a way as to keep it damp. A good belt treatment or lubricant will do the trick, but care must be exercised to not overdo the treatment, for then the belt is liable to slip, and it is the friction due to slipping that usually is responsible for static.

Dry air, dry belt, rubbing, high speed, iron structures, etc., are all contributory causes of static, but friction is the principal cause, and the principal thing to eliminate; therefore, is the belt slip.

When this method fails to stop the static, the best way to get rid of it is to lead a few copper wire terminals up to the belt, allowing the ends to touch both the top and bottom of the belt while running, but don't allow the pressure of the wires to be great enough to scratch or injure the belt in any way. All that is needed is contact, not pressure. The best location for these wires is about halfway between the pulleys.

Lastly, "ground" the wires to a pipe that runs into the ground or run a wire into the ground for the express purpose of taking care of the static.

The princial nuisance that goes along with static in belts is the attraction it has for lint and dust particles, carrying the same along, causing more belt slip, and often throwing lumps of this lint down onto the moving threads, thereby causing lumpy, and frequently broken yarn. With elimination of static, all of these troubles disappear.

W. F. S. (New York.)

"Whilst another man has no land, my title to mine, your title to others is at once vitiated."

## Comments on Previous Letters.

EDITOR COTTON:

I see on page 85 of the December issue of COTTON where "Ed (Maine)" wants to know what causes the collars on metallic rolls to have flat places on them.

The setting of the rolls will not make any difference. Not long ago I was up against the same trouble. I was then superintendent of a New York mill, and the following is the way I doped the matter out: (1) I knew that the flat place was due to a violent shock caused by the sudden contact of the two collars. (2) I knew that it was either the lack of weight or clogged flutes. (3) I knew that when metallic rolls are dry, they will offer enough resistance to the bottom roll to ride the flutes of the bottom rolls which will cause sudden contact. (4) A too bulky sliver will cause intermittent contact, but not violent.

However, "Ed" will no doubt find the trouble to be due to some one of the causes given. The rolls must first be repaired. Next, see if every weight is in the proper place. Then be sure that the proper weight is on every roll. Keep the rolls in contact at both ends, and the only way this can be accomplished is by keeping the flutes clean at all times, and by having the proper amount of weight on each.

I give the following weighting which I use which I hope will prove helpful to "Ed." For a 40 grain carded sliver with a draft of six on each head, 6 pounds on the first roll, 8 on the second, 10 on the third and 12 on the back roll. Following is a table which always proved satisfactory:

ROLL WEIGHTING FOR METALLIC ROLLS.

| Weight of sliver. | Grains. 40 | Grains. 45 | Grains. 50 | Grains. 55 to 60 |
|---|---|---|---|---|
| 1st Rolls | 6 lbs. | 8 lbs. | 10 lbs. | 12 lbs. |
| 2nd Rolls | 8 lbs. | 10 lbs. | 12 lbs. | 14 lbs. |
| 3rd Rolls | 10 lbs. | 12 lbs. | 14 lbs. | 18 lbs. |
| 4th Rolls | 12 lbs. | 14 lbs. | 18 lbs. | 24 lbs. |

For every additional increase of 50 revolutions per minute over a standard of 400 revolutions per minute on which this table is based, increase the weight one pound.

I see where "A. J. O. (R. I.)" states that he never saw a stripper or lap-carrier carry more than one lap at a time, and for that reason fails to see how I can call it a common practice. His statement, of course, can be accepted as one man's opinion. I had a robust fellow working for me once, who would swing two laps on one of his shoulders and carry a third in the other hand. The lap weighed 40 pounds. I stopped him, and I have discharged more than one man for insisting carrying two laps at one time, for the reason that a large amount of waste results from such a practice. The practice is common in a good many northern mills.

I have had quite a bit of experience in different positions and in different sections, and I have tried and am try-

ing to benefit the readers of this department by describing these experiences. I believe I have succeeded in spots.

By the number of the change gear given in my previous article, "A. J. O." should see that the change was made on a Kitson picker. No matter how coarse the work may be, no lap should weigh heavier than 12 ounces to the yard, that is, if clean warp is expected. The more bulky the lap, the less the beater and grid bars become a cleaning agent. Running a light lap and speeding up the feed on the card will give better results. Try it! Besides it will enable the licker-in to be set almost to touch, which is one of the best points I know of in carding. I explained the reasons in these columns in a previous issue.

Also in the December issue I find another confessed convert to the flyer-lead frame. I was much interested and pleased with this letter, not because it was in line with what I believe to be so, but because my work and arguments on the subject has not been in vain.

In the November issue a similar confession appears from a gentleman, who, by the way, is a graduate of a textile school. I wonder if the heads of the different textile schools took notice?

In a former issue, "Lanes (Mich.)", claimed that I spring something new that makes the boys think. Here is another. Which is the most efficient differential motion? Where is it made? What makes it the best differential motion? Why?

Wash. (Mass.)

## Announcement.

H. C. Harding (formerly president of Harding & Fancourt, Inc., of 516 South Delaware Ave., Philadelphia,) begs to announce that he has purchased the business of M. W. Kerkeslager, Incorporated, of Sedgley avenue above Seventeenth street, Philadelphia, and will henceforth occupy and operate their well equipped soap and oil plant, in connection with the importing business which he has heretofore carried on.

The business will be continued at Sedgley avenue under the title of H. C. Harding, Incorporated and will be able to take care of the trade of his friends and those of M. W. Kerkeslager, Inc., in a superior manner, offering an unequalled assortment of all goods in their line, with prompt delivery and standard quality. Among these goods are soapmakers' oils, lubricating oils, olive oils, cotton and wool softeners, imported and domestic wool oil, animal oils, soluble oils, leather dressing oil, vegetable oil, turkey red oil, glycerine, emulsions for all purposes, soaps of all descriptions, and textile specialties and oils for all purposes.

Unfortunately for the cotton manufacturer, the machinery in his mill needs constant attention and repair in order to keep it in the very best operating condition. Some of this repair work is easily accomplished within the walls of the mill, but there are other kinds of repair work that should be handled by experts in these particular lines. The Southern Spindle and Flyer Company, Inc., of Charlotte, N. C., are prepared to do repairs and alterations of all kinds, including scientific lining and leveling, straightening spindles, balancing flyers, and other similar necessary repair work.

## Making Changes in the Card Room.

EDITOR COTTON:

"How few think justly of the thinking few, how many never think who think they do." Every reader should consider this quotation.

The object of this letter is to show that often when a change is made in our mills, the mind devising it is too centered on the object of the change and the benefit it will bring. For intsance, we must admit that a light sliver is better than a heavy one, for the reason that it requires less drawing, and, of course, the less you draw, the less severe is the treatment of the fibers.

Manufacturers are daily adopting the light sliver for the reason that they learn of the successes of others running in this manner. However, many carders seem to think that in making a light sliver that the change is sure to improve the work, all they have in mind is that the stock will be drawn less.

Let us study for a moment the few lines quoted, "How many never think who think they do." In making a change, the carder should think and then think some more.

I just received a letter from a superintendent of a mill, which states in part, "while here you advised me to run a light sliver, but after following your advice I find the work does not run as well." After reading the letter the thought came to my mind that the lap in the picker room was reduced from 12 ounces to 10 ounces per yard. He does not state that the beater speeds were not reduced and that is where a great mistake was made. When you reduce the feed of any picker, you increase the blows to the inch, for the slower the feed-roll the more blows the cotton is struck, and there is nothing more detrimental to cotton than too rough usage—see the point? Never strike the stock more than 40 blows to every inch of stock.

Wash. (Mass.)

## What is the Madder Test?

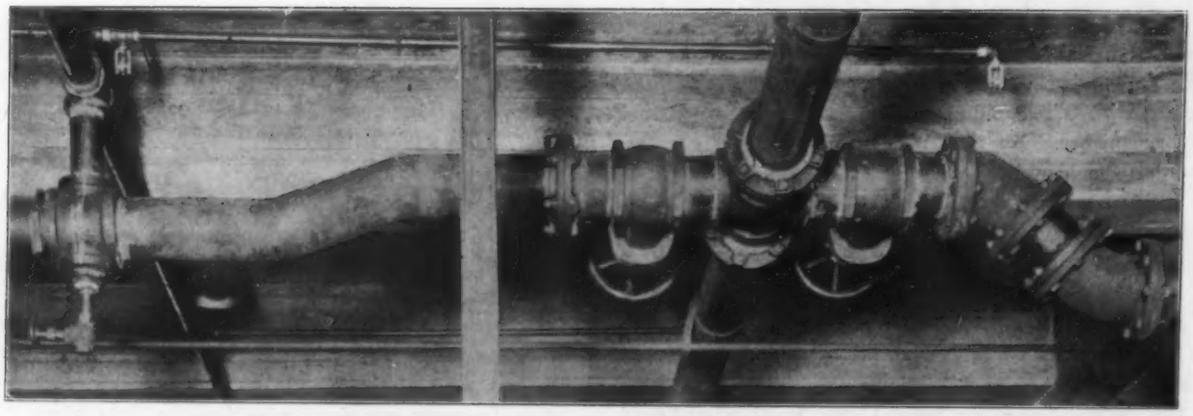
EDITOR COTTON:

I recently noticed the answer to Beginner in regard to Indigo Sulphate, and would also like to ask a question along the same line. What is the "Madder test" and how carried out? I understand it is a method of determining whether a bleached piece of goods is properly bottomed.

A Bleacher. (North Carolina.)

The demands of new business from the South for the products of the Economy Baler Company, Ann Arbor, Mich., has so much increased that they have just opened an office in the Empire Building, Atlanta, Ga., to take care of this southern territory. J. F. Hulme is in charge. It is of interest to note that this is the tenth branch office in three years which this company has established.

Rosin soap for use in bleacheries and print works and rosin size in starching fabrics, are two articles highly recommended by their makers, The Arabol Mfg. Co., 100 William St., New York City, as being perfectly uniform, free from impurities and thoroughly filtered. Whoever uses them is pleased by their effectiveness and economy.



## A Novel Welded Pipe Connection.

While most cotton mill officials are now fully aware of the usefulness of oxy-acetylene welding in ordinary repairs, it is a fact that a great deal of work which could be handled more economically and more efficiently by this process is oftentimes completely overlooked in favor of older and what are fast becoming obsolete methods. This was illustrated very forcibly by a recent sprinkler pipe installation handled in the Indjanapolis plant of The Prest-O-Lite Company, Inc., one of the leading exponents of the oxy-acetylene welding process.

It became necessary to run branches from the 6-inch water main of the sprinkler system in the company's plant. On account of the fact that the main had been hung so close to the ceiling, offsets in the branches were required to clear the concrete girders and other piping already in place. The usual procedure of employing ordinary screwed fittings was started until it was found that on one side a drop of 7½ inches was required, making the use of standard fittings with 6-inch pipe impossible. The connection was finally made by using regular 45 degree flanged elbows and nipples giving the pipe a 12-inch drop. The cost of the offset effected in this manner, including all of the necessary parts and labor for connecting the job, was $17.50. Had it been possible to make the offset with standard screwed fittings, the job would have cost $5.66.

The branch on the opposite side of the main, however, presented an altogether different problem. A downward offset of exactly 5¼ inches was necessary to clear pipes above and below the new line. Standard fittings, either flanged or screwed, could not be used and an estimate was obtained on the cost of bending the pipe for the required offset. It was found that this method would cost $18.60, including the bent pipe and labor for connecting. Furthermore, a considerable delay would have been occasioned in waiting for the pipe to come from the mill.

The idea of employing oxy-acetylene welding was then suggested by one of the factory employees. A short section, cut at each end at the proper angle to give the offset desired, was welded into the line, at *a total cost of $3.40,* as compared with the cost of $17.50 for the flanged job and $18.60 estimated for the bent pipe.

The illustration shows the two methods of obtaining the offset, the one on the left by welding and the one on the right by using flanged fittings. It will be observed that the welded connection, in addition to its greater economy, also is very much neater in appearance and occupies comparatively little space. It is plain from the foregoing that the utmost possibilities of oxy-acetylene welding in plants, even where the process is familiarly known and extensively used, are not yet fully appreciated.

## Oiling and Cleaning.

EDITOR COTTON:

Two things that go to help make good clean and even work in a cotton mill, is the oiling and cleaning of the machinery. These two operations play an important part in bringing good results, but some way or another, one of these is neglected for some reason that is hard to explain.

The oiling of the machinery should never be neglected, and should always receive careful attention by one man in each room. It should be his duty to do nothing but oil the different parts of the frames, also the shafts, loose pulleys and all that needs to be oiled. This by no means is too much for any one man to do. The writer once worked in a certain department that had one man in charge of the oiling. This man attended to his duties and had plenty of time to spare, which he devoted to helping his wife, who was a spooler-tender, in the same room.

To the writer's mind there are no two mills with the same rule regarding the oiling of frames, for the simple reason that each man in charge of the different departments had his own schedule; but that does not prevent the oiling of the machinery, by any means, if the man whose position you have taken made it a rule of oiling the frames only once a week you get better results, do not hesitate, but enforce your rule and things will be easier for you and all concerned.

When I first took charge of a slashing department in one mill, the man who was in charge before I took the position had made a rule that called for the oiling of the machinery only once a week, the beauty of said rule, besides being a poor one, was that it was not enforced. The slasher tenders would oil whenever they saw fit, so long as they finished before the week was over. Some would start on Monday and do a little and by the time they went over the whole machine it was Monday again; others would not get started until Wednesday or Thursday and so on, which to my mind was something that wanted to be remedied as soon as possible.

On the following Monday after I took charge, I went to each slasher-tender and told him that I wanted his machine properly oiled before noon. I knew they did not like

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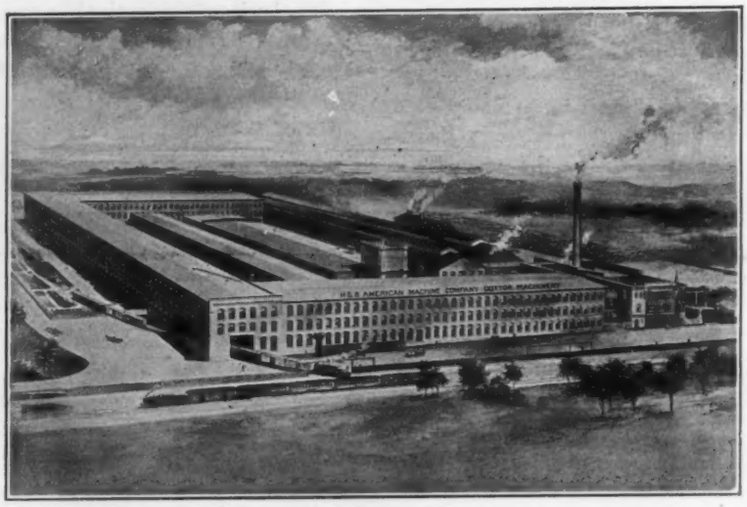
Atlanta, Ga.

COTTON MACHINERY

Opening and Picking Machinery

Card Room Machinery



Spinning Room Machinery

Twisters for Wet or Dry Work

With Band or Tape Drive

H. & B. AMERICAN MACHINE COMPANY
PAWTUCKET, R. I.

this new rule. At one o'clock I came and examined all the slashers and found that the rule had been obeyed. I kept silent.

Thursday morning I again went around and repeated the order of Monday. They were surprised at the idea of oiling twice a week. I explained to them what my aim was, also of all the time that would be left to them after oiling, for as we remember the other overseer's rule, there was a little oiling done each day, which is a very poor practice and should never be allowed in any department.

This rule still holds good and we are getting good results; furthermore, we all know that a slasher is a machine of heavy construction and requires plenty of oil.

Having a proper rule for the oiling of slashers, I will give one which I used on twisters. There are many parts on a twisting machine that are never oiled. What little oil these parts get is from the rings, where, on starting up, the travelers sprinkle it all over. It may sound strange, but if any reader disagrees, let him try the following test:

Stop a twister that has not been cleaned for two weeks (I mean such parts as the stands, weights, rail rods and the back of the rails) then take a handful of the waste that has accumulated on these parts and squeeze it. What will happen? Why, the oil will be squeezed out just as water is squeezed out of a sponge, which goes to show and is proof enough that some parts never receive oil, other than that which is sprinkled by the travelers, as above stated.

The writer knows this to be true for he has tried the thing time after time, yet many a time there is a rail rod that has stuck. What is the cause? Simply this: being dry, and in rising and falling it binds, thus holding one end of the rail; the result is an armful of bad bobbins if not discovered soon enough.

When anything like this happens, take a piece of emery cloth and rub this certain rod, then oil it properly and there will be no more binding.

A good rule for twisters is to oil all spindles on the frames each noon hour. This is done by a man who, through the day, puts up yarn and bands on the frames. The reader must bear in mind that there are more than one make of bolsters. These that I will refer to are of the older type, the spindle being lifted out of the bolster and the oil poured in, then the spindle is lowered, the band put on and the catch screwed. Thus the reader can see that there has got to be plenty of oil put in these bolsters to last.

There are other makes of bolsters, where the oil is poured through a tube, thus making possible the oiling of a greater number of frames per day and also a saving in oil, as in the old type of bolsters when the spindle was lowered the excess oil was squeezed out, thus dripping on the frame and the floor.

With the latter type of bolsters I have a boy who oils five frames each day, and there being thirty frames in this room, the readers can see that each is oiled once a week. The rail rods are oiled every other week when the rails are washed. Oil on rail rods lasts a few days and it takes only a small amount. Pulleys are what require a great amount of oil. In some mills they are oiled twice a day. This is a good rule, but the writer helps it along by supplying each twister tender with a can, and seeing that he oils

each pulley every time the frame is about to be stopped for doffing, thus insuring perfect lubrication at all times and doing away with hot pulleys which often bind and cause a lot of trouble.

The other movable parts of the twister should be oiled properly twice a day, also the overhead bearings and shafts.

There are corporations in which all the oiling is left entirely to one man. This is a poor practice, for the reason that he may oil some rooms better than others, or some parts receiving more than others. Thus we see that in having one man in charge of oiling in each room, good results are obtained, for at a glance the person in charge of any department can find any fault on the part of the oiler in failing to do his duty.

Tab. (Mass.)

## Wearing of Spinning Rings.

EDITOR COTTON:

I see in the November issue of COTTON where "M. J. J. (Georgia)" differs with me regarding the wearing of spinning rings.

The idea I tried to convey to the reader in my previous letter was, that any vibration on the yarn from any source, such as a spindle being out of center, or the yarn touching the separator blade, would cause the rings to wear wavy.

"M. J. J." also states that the weight of the travelers has nothing to do with the wearing of the rings. "Textile Texts" which is a book published by the Draper Company, says. "Those who have tested the matter understand perfectly that a small traveler wears the ring much more rapidly than a heavy one." What about this?

Wash. (Mass.)

## A Question for Looper Fixers.

EDITOR COTTON:

Will some of the readers of your practical discussion department kindly advise me how to stop the German Looper from "skipping?" Also advise me how to keep the cut top clippings from running under and breaking the needles.

E. R. N. (North Carolina).

## An Extension of Time.

Exporters will be interested in the recent annuncement made by the Treasury Department that in order to allow them further time in which to familiarize themselves with the provisions of Treasury Decision No. 35708, relative to shippers' declarations and export procedure, and to provide themselves with the necessary blank forms, the date upon which said decision becomes effective has been changed from January 1 to February 1, 1916.

All the authorities who have studied the question agree that cotton cultivation in Argentina is both practicable and profitable if seriously undertaken. Cotton of good quality is actually produced in the Republic on the insignificant and scattered area (about 7,400 acres) devoted to it. The product has been exported and has realized good prices, but in recent years the industry has languished.

## Latin American Monetary Systems and Exchange Conditions.

BY JOSEPH T. COSBY.*

### ARGENTINE REPUBLIC.

The basis of Argentine's monetary system is the gold standard. The unit is a gold peso, divided into 100 Centavos, weighing 1.6129 grammes of gold .900 fine, or say 1.4516 grammes fine gold. Its part value expressed in terms of U. S. currency is $0.96475. The parity of $1.00 U. S. currency in terms of Argentine gold pesos is $1.0365.

The actual currency of the Argentine is Government notes, to which a fixed value of 44 per cent of the gold peso has been assigned by the Government. This parity of 44 per cent is maintained through the medium of a conversion fund which exchanges gold for paper, and vice versa, on the basis of $44.00 gold for $100.00 paper, or $227.27 paper for $100.00 gold.

Since, then, the value of the paper peso is fixed by Governmental decree and is maintained through the conversion fund, the paper peso represents 0.6387 grammes of fine gold, and its parity expressed in terms of U. S. currency is $0.4245. The parity of $1.00 U. S. currency in terms of Argentine paper pesos is $c/l 2.35576.†

Bills of exchange on Foreign countries are quoted in both paper and gold, but usually they are quoted in gold. When Buenos Aires quotes New York exchange on the basis of paper currency, the quotation represents the equivalent in U. S. currency of $1.00 paper pesos; thus, 42.50 means that $0.4250 U. S currency is the equivalent of $1.00 paper peso. When Buenos Aires quotes on the basis of the gold peso, the quotation is expressed in gold pesos; thus, "New York sight $1.0375" means that $1.0375 Argentine gold pesos is equal to $1.00 U. S. currency.

While conditions were disturbed in the Argentine during the early weeks of the war, the exchanges held remarkably firm and quickly returned to more or less the normal rates. This was due principally to the character of the Argentine's exports, and the urgent demand existing for those products, consisting of foodstuffs, hides, wool, etc.

### EXCHANGE RATES.

The foreign exchanges are quoted in the Argentine as hereunder noted:

| | | | |
|---|---|---|---|
| London | 90 d/s | 47-7/8d=$1.00 | Peso gold |
| Paris | 90 d/s Francs | 5.0325= 1.00 | " " |
| Germany | 90 d/s Marks | 4.07= 1.00 | " " |
| New York | Sight U. S. Cy. | $1.00= 1.0350 | " " |

*Manager Foreign Department, The National City Bank of New York.

†Note: The Sign $c/l stands for Paper Currency and is an abbreviation of Curso Legal.

Lowinson's Comparative Cotton and Cotton Goods Chart for 1915, is now being prepared for the printer and will be ready for distribution about the middle of January. Anyone interested may receive one gratis by sending a request to Louis Lowinson, cotton goods broker, 72 Leonard Street, New York, N. Y. The chart will contain the usual constructions of grey cotton goods as well as the varying prices of spot cotton throughout the year of 1915.

Barrett Specification Roofs

41,500 square feet of Barrett Specification Roofs on N. Y., N. H. & H. R. R. Pier 37, East River, N. Y. C. General Contractors: Snare & Triest Co., N. Y. C. Roofers: Wm. R. Young, Jr., Inc., Brooklyn.

# *Under Waterfront Exposure—*

TUGS and steamships come alongside and vomit hot coal smoke and sparks over this roof. Wind and storm get a full sweep. But the roof is a Barrett Specification Roof—the one kind that is not hurt by such exposure.

That is why the Barrett Specification type of roof covers pier after pier as far as the eye can see up the busy East River waterfront from the great bridges overhead. It is the standard roof for such hard service. Leading construction engineers specify it almost as a matter of course.

The Barrett Specification in your building plan furnishes a fair basis for competitive bids. It insures the best materials being used. It specifies the most approved method of construction.

The net result is that Barrett Specification Roofs last twenty years or more without leaks or repairs or maintenance expense.

They cost less to build than any other permanent roof. They take the base rate of insurance and are approved by the Underwriters' Laboratories.

Copy of the Barrett Specification with roofing diagrams free on request.

**Hydronon**

**The Damp-proofing Paint.**

Reduce building expenses by coating the inner surfaces of all walls above the ground level with Hydronon and apply the plaster directly on the wall without lath and air space. The Hydronon excludes dampness and gives a dry base for the plaster.

Hydronon is very dense and penetrates into the wall forming a tight seal. It has superior covering capacity and is vastly superior to other damp-proofing paints in its permanent resistance to dampness. Its superiority has been demonstrated by a series of scientific tests which are described in a booklet which will be mailed free on request.

**Velvet Creosote Shingle Stains**

Every desirable color in soft velvety shades. Can be used on unplaned wood of any kind. The creosote makes them highly preservative and non-inflammable. Booklet free on request.

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TRADE B MARK

# Notes About Men You Know.

WALTER B. KNIGHT, the agent at the mills of the Quidnick-Windham Mfg. Co., at Willimantic, Conn., has succeeded J. H. Hambly of the Quidnick-Windham Mills at Quidnick, R. I., and is now in charge of both plants.

JOHN J. WALMSLEY, who has for many years been the overseer of weaving at the Quidnick (R. I.) Mills of the Quidnick-Windham Mfg. Co., has been promoted to assistant superintendent af these mills.

FRANK W. GURRY, formerly of the Postex Mill of Post City, Texas, and originally from Providence, R. I., has been appointed general superintendent of the Graniteville Mfg. Co., Graniteville, S. C.

JAMES R. GRUBB of Greenville, S. C., has accepted the position of superintendent of the Cowpens (S. C.) Mfg. Co.

E. M. BUFFINGTON has been appointed superintendent of the H. A. Romberger Knitting Mill, Newport, Pa., in place of the late A. D. Hoke.

J. E. RYAN, sales and advertising manager of the Superior Underwear Co., Piqua, Ohio, has been invited to address the Dayton Ad Club on advertising and merchandising the last Monday in January.

FORREST B. GARDNER, for several years at the head of the cost department of the Fulton Bag and Cotton Mills, Atlanta, Ga., has resigned to accept a similar position with the LaGrange Mills, LaGrange, Ga.

JOHN C. SMITH, for the past 18 years superintendent of the Chace Mills, Fall River, Mass., has tendered his resignation. Mr. Smith is one of the best known mill men in New England, having been connected with the corporation as overseer and superintendent for 36 years.

ERNEST A. KIRBY, at present superintendent of the Fall River Iron Works mills at Fall River, has accepted the position of superintendent of the Chace Mills in place of John C. Smith, resigned.

WILLIAM A. EVANS, who is now assistant superintendent of the Fall River Iron Works mills, Fall River, Mass., will become superintendent of the plant in place of Ernest Kirby, resigned.

JOHN L. STAMEY has accepted the position of superintendent of the Saxony Spinning Mills, Lincolnton, N. C.

J. R. WATSON has become secretary of the Cochran (Ga.) Cotton Mills.

B. A. FAHEY has been appointed superintendent of the Bennett Mill of the New England Cotton Yarn Co., located in New Bedford, in place of Lewis E. Bentley, resigned. Mr. Fahey has been with the company for many years, being for the past three years superintendent of the Globe Thread Mill.

J. L. MCNAIR has been elected president of the Dickson, Scotland and Waverly Cotton Mills of Laurinburg, N. C., succeeding J. P. McRae.

M. J. BOURGEOIS, for several years overseer of spinning, spooling and warping for the Bourne Mills, Fall River, Mass., recently resigned from that position.

WM. KOEHLER has been elected as treasurer of the Mississippi Cotton Mills, Moorhead, Miss.

G. G. WILBANKS has resigned as overseer of slashing at the Clinton Mill, Clinton, S. C., and returned to his former position as overseer of slashing at the Lydia Mill, of the same place.

HENRY HARRAP, boss comber for the past five years at the Rotch Mill, New Bedford, Mass., has resigned and gone on the road for the Whitin Machine Shop to set up combers.

B. F. MCCLURE has resigned as night superintendent of the Bladenboro (N. C.) Cotton Mills, to accept a similar position at the Lumberton (N. C.) Cotton Mills.

GEORGE CARTER has become overseer of ring spinning at the Shetucket Co., Norwich, Conn., in place of E. S. Johnson, resigned.

S. E. COOPER has been elected secretary of the Mississippi Cotton Mills, Moorhead, Miss.

R. L. BRYANT has resigned as overseer of slashing at the Eva Jane Mills, Sylacauga, Ala., to become overseer of dyeing, warping and slashing at the Avondale Mills, Birmingham, Ala.

T. H. HENDERSON, who last week resigned as superintendent of the Cowpens (S. C.) Mfg. Co., has accepted a similar position at the Appalache plant of the Victor Mfg. Co., Arlington, S. C.

L. L. BROWN has resigned as overseer of spinning at the Riverside Mill No. 2, Anderson, S. C., to become superintendent of the Swift Spinning Mills, Columbus, Ga.

CARL JONES was recently appointed superintendent of the Utica Knitting Co., Utica, N. Y.

WILLIAM A. LANGFIELD has succeeded Edwin Mellor as instructor in mule spinning of the night classes at the Bradford-Durfee Textile School, Fall River, Mass.

RALPH W. SHIELDS has become overseer of carding and spinning for the Campbell Knitting Co., Elmira Heights, New York.

J. S. CHASTAIN has resigned as overseer of cloth room at the Panola Mills, Greenwood, S. C., to accept a similar position at the Ninety-Six (S. C.) Cotton Mills.

W. J. MCDONALD of Schoolfield, Va., has accepted the position of overseer of carding at the Bloomfield Mills, Statesville, N. C.

C. W. EVANS of Newberry, S. C., has accepted the position of overseer of cloth room at the Panola Mills, Greenwood, S. C.

W. A. JORDAN has resigned as overseer of the cloth room at the Capital City Mills, Columbia, S. C., and has accepted a similar position at the Darlington (S. C.) Mfg. Co.

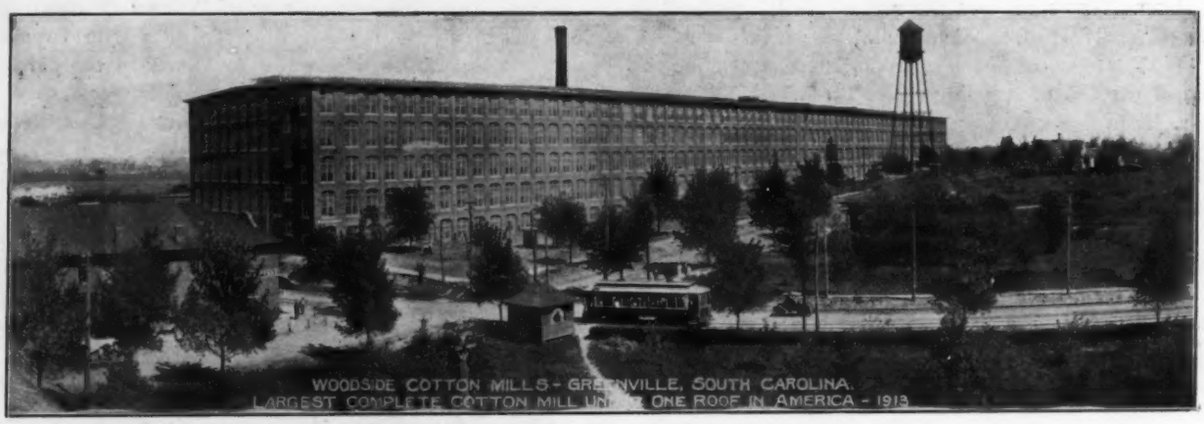
CALVIN NIX has resigned as manager of the Continental Finishing Co., Riverpoint, R. I.

M. J. WEINSTOCK, of Minneapolis, Minn., has become assistant superintendent of the Marinette (Wis.) Knitting Mills.

W. S. MOORE has accepted the position of overseer of spinning at the Dixie Mills, Mooresville, N. C.

J. M. BUTLER has been elected president of the St. Pauls (N. C.) Cotton Mills.

C. C. SYMMINGTON has been appointed manager of the yarn department of the Whitman Mills, New Bedford, Mass., in place of George Kennedy, resigned.




Pyrene
TRADE MARK
Fire Extinguishers

# Protect this Greatest of all Cotton Mills.

Day and night thirty Pyrene-carrying watchmen guard this factory from fire.

Practically every leading cotton mill and warehouse in the United States is Pyrene-protected.

Pyrene is the logical cotton fire extinguisher because:

It can be reached and thrown on a fire in five seconds.

It will cut the flash in burning cotton faster than it can travel and will absolutely put out the spark.

It will quickly penetrate the oiliest waste, since Pyrene liquid is a degreasing agent.

It will not damage the cards, card clothing and other delicate machinery in cotton mills.

It affords the maximum of fire prevention in a mighty small package.

**Write for interesting booklet.**

**Inspected, Approved and Labeled by the Underwriters' Laboratories, Inc.**

# Pyrene Manufacturing Company

**Atlanta** **New Orleans** **Nashville** **New York City**

JAMES COYLE of East Greenwich, R. I., has been appointed manager of the Continental Finishing Co.

W. T. JONES, of Schoofield, Va., has accepted the position of overseer of spinning at the Bloomfield Mill, Statesville, N. C.

C. H. WATMOUGH is the new superintendent of the Barrowsville Bleachery, Barrowsville, Mass. He has been actively engaged in that line of work for 40 years.

LLOYD KIRKPATRICK, for the past three years assistant superintendent of the Merrimack Utilization Company, Lowell, Mass., has been appointed superintendent of the plant and assumed his new duties on December 1.

PRESIDENT ALBERT GREENE DUNCAN, of the National Association of Cotton Manufacturers, was one of the speakers at the annual meeting of the American Society of Mechanical Engineers. As a member of the sub-committee on textiles he delivered an address on "Heating by Forced Circulation of Hot Water in Textile Mills."

W. B. MOORE, president of the Mills Mfg. Co., Greenville, S. C., is rapidly recovering from the effects of a serious operation at the Mayo Hospital, Rochester, Minn.

F. G. PARKER is now general superintendent at Mount Holly, N. C., in the place formerly occupied by I. B. Covington. He has under his care the Albion Mills, the Mount Holly Mills and the Tuskaseege Mills.

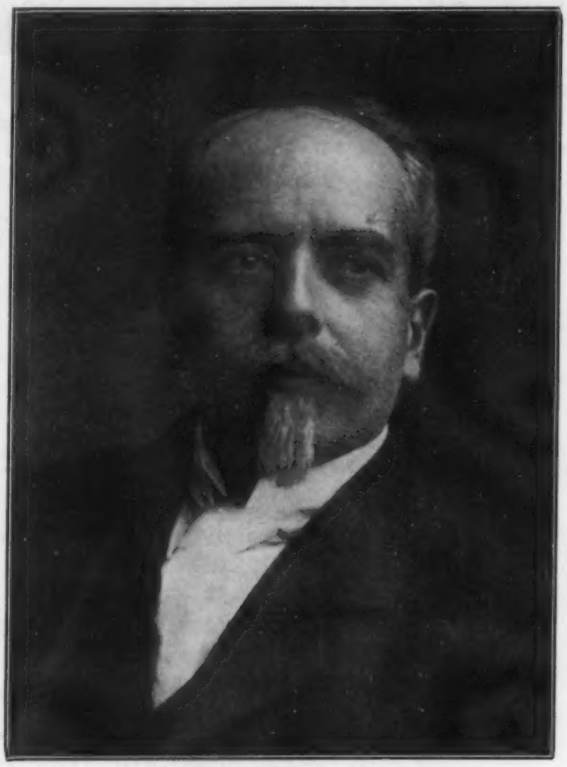
ROBERT E. LEE, overseer of the ring spinning department of the Pontiac Mill, at Pontiac, R. I., for the past three years, has resigned his position with that corporation to accept a similar position at the Androscoggin Mill at Lewiston, Me.

LEONARD PAULSON, who died at the home of R. S. Rinehardt in Lincolnton, N. C., recently, had been in the cotton yarn commission business for many years, and had many friends in the South. He visited here often, and had considerable business connections in this section. He was an associate member of the American Cotton Manufacturers' Association, and always attended the meetings when possible. Mr. Paulson, who was in his 67th year, was recognized as the dean of the cotton yarn trade in New York, having been in the business for the past 50 years, and known throughout the entire country by spinners, buyers and handlers of cotton yarn. He was born in New York City, the son of Leonard Paulson, and after serving as a member of company B, Ninth Regiment, New York, received an honorable discharge in 1865. Shortly after returning home he became associated with the old yarn house of John W. Conway & Co. The firm of Buckingham & Paulson was organized in 1901, and this firm on the death of Mr. Buckingham in 1903, was succeeded by the firm of Paulson, Linkroum & Co. Mr. Paulson leaves a widow and three daughters. The funeral services were held at Fresh Pond Chapel, Long Island.

JAMES MAPES DODGE, chairman of the board of the Link-Belt Company, died at his home in Philadelphia, December 4th, 1915. He was born June 30th, 1852, and spent three years at Cornell University and a year at Rutgers. At the latter institution he took a special course in chemistry. After a short time at the Morgan Iron Works in New York City, he entered the shops of John Roach, shipbuilder, Chester, Pa., where his marked mechanical ability and ingenuity brought him rapid advancement.

In 1876, he left the shipyard, and after several years of experience in the East, went to Chicago. It was here that he formed the acquaintance of William D. Ewart, the inventor of the Ewart link-belting, and soon after, he joined hands with Mr. Ewart and his associates in the development of the chain business.

At that time the application of chains in elevating and conveying machinery was practically unknown. The Ewart chain blazed the way for a new industry, and Mr. Dodge and his associates were quick to seize the opportunity. After this period of development Mr. Dodge went East and entered into partnership with Edward H. Burr under the firm name of Burr & Dodge for the exploitation of the Ewart chain and its allied interests. Out of this partnership grew the Link-Belt Engineering Co., organized in 1888, and after the formation of this company, Mr. Dodge carried out his idea of development along strictly engineering lines. A highly specialized engineering staff was developed, a scientific study was made of the characteristics of the materials to be handled, and special appliances were invented to meet varying conditions.



JAMES MAPES DODGE.

Though for many years a large employer of men, Mr. Dodge never met with any strikes or other labor difficulties. He was deeply interested in the personal welfare and advancement of his associates, and a conspicuous leader in the general introduction of the best elements in "scientific management," having the double purpose of producing greater efficiency in the mechanical and human equipment, and greater pay with shorter hours and improved conditions for the men. He was for many years closely associated with the late Frederick W. Taylor in the accomplishment of remarkable results for the benefit of both employers and employees, in a wide circle of industries. His influence was always towards the development of self-help, initiative, ambition and responsibility in the men, and of a spirit of fair play and humanitarianism as real business assets.

# KNITTING SECTION


## TRANSFERRED HOSE AND HALF HOSE

when made on our

**Model B**

with automatic means for preparing the machine for transfer, require less moves on the part of the operator. This means increased production and lower cost.

ESTABLISHED 1865.

**Scott & Williams, Inc.**

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5 Blandina Street

# ABERFOYLE MANUFACTURING COMPANY

DYERS, BLEACHERS, GASSERS

DYERS OF COLORS FAST TO SUN AND BLEACHING

# MERCERIZED YARNS

*Our Yarns are the Products of American Mills*

MAIN OFFICE

CHESTER, PA.

402 MORRIS BUILDING
PHILADELPHIA

746 INSURANCE EXCHANGE
CHICAGO

# The Present and Future in Knit Goods

The year of nineteen-fifteen, which has just slipped away into the reminiscent past, was a notable year in many respects. From the standpoint of the knit goods manufacturer and his selling connections it was a year of promise and of worry. Business increased to the point of normal or better, but was accompanied by a dyestuff shortage which threatened and still threatens disaster unless the campaign for "whites" proves successful. A study of the present and immediate future as seen by men prominent in the industry is fraught with interest. We, therefore, requested some expression of opinion from a number of such men, and while we know they are not seventh sons of seventh sons, we believe that the outlook as seen by these clear-eyed business men will be well worth the attention of any student of the future. Following are extracts from some of the many letters received:

C. C. ALLEN, President of the Chicago-Kenosha Hosiery Co., Kenosha, Wisconsin.

"As regards the present situation, we can only say that never in the history of our business has there been such an unprecedented demand for practically every grade of hosiery. We presume that in a large measure this is due to the fact that for some time past dealers have allowed their stocks to go far below the average.

"We can see nothing but bright prospects for next year, as far as the sales feature of our business is concerned. Of course with the extreme prices on raw material, it doesn't help matters in the production end of the hosiery business. With silk, fiber silk, cotton yarn and woolen yarns all higher, and dyestuff more scarce, naturally 1916 doesn't look very propitious from the standpoint of mill profits.

"As to the effect on the industry of the dyestuff shortage and the war, we believe that contributions to the dye stuff situation, such as the production of aniline oil, will materially reduce the high pressure caused by the scarcity of the imported article. In fact, we have demonstrated to our satisfaction that we need not be dependent upon any foreign country as far as fast black is concerned.

"We have predicted for some time that inasmuch as the United States is at present, and will probably be for some time, the world's market on knit goods, there is bound to be a shortage. In such a case we are making every effort to take care of our 8,000 regular dealers, and in the event of surplus, carry it over to the foreign markets, which at present are extremely active in their requirements for American-made goods.

"We are *most emphatic* in our belief that there should be tariff changes made in order to be prepared for conditions that may arise after the war. Of course, as long as the war continues we have a complete high protective tariff on knit goods. We certainly should make every effort to change the tariff with regard to knit goods and especially to encourage dyestuff manufacturers in this country—with a view to preventing a dumping of foreign-made goods in this country at ruinous prices after the war."

GARNETT ANDREWS, President, Richmond Hosiery Mills, Rossville, Georgia:

"I have just visited New York and I have never seen business in better condition. This seems to be the case with all lines, and is not confined to the textile business.

"As for the effect of the war on the hosiery business, I find that every mill is running full that has any dyestuff. I believe the dye situation will be fairly well solved by March. This refers to black, but not to colors. It will be a good bit longer before the color question will be solved, and some very unheard of prices are being obtained at present by holders of colors.

"The export demand for hosiery is something tremendous. We have had buyers in our office from New Zealand, Australia, China, Scandinavia, Greece, Italy, South Africa, Uruguay, Argentina, Chile, West Indies, Great Britain, and some of our goods are finding their way to Germany and some to Russia. The trouble is going to come when the war is over and we start out picking up our old competitor — Germany. We will then need an Anti-Dump Clause in our Tariff Bill, together with some increase, I think, in the tariff."

JOHN WYCKOFF METTLER, President, Interwoven Stocking Company, New Brunswick, N. J.:

"It is our opinion that cotton will stay at about its present level, subject to moderate fluctuation each way for the 1916 business. Everything else, we believe, will be fully as high as at present, and most everything higher. Outside of those who are fortunate enough to be provided with German dyestuff, you can count on the use of lower grades of dyes and of pale shades of color to stretch them out in quantity.

"Unless we have ample tariff protection immediately upon the close of the war, this country will revert to the condition it was in before the war. It should be perfectly apparent that the war has operated to exactly the same effect as an impassible tariff wall."

Jos. S. RAMBO, President, Globe Knitting Mills, Rambo & Regar, Inc., Norristown, Pa.:

"The European war has practically made a tariff wall around the United States, and in addition to that, has opened the South American markets to the United States. We are, therefore, reaping our harvest at the present time, but it is the writer's opinion that after the termination of the war, things will be quite different and we will then need badly a protective tariff bill, such as the Payne-Aldrich Bill, to give us the needed protection to control our own market.

"In reference to the dyestuff situation, blacks, which have been very scarce, are getting more plentiful, but the situation on colors is now getting in bad shape. This country would, undoubtedly, in a short time be prepared to make most of the dyestuffs needed here if they had sufficient encouragement from Congress that the industry would be protected from foreign competition."

D. L. GALBRAITH, Treasurer, World's Star Knitting Co., Bay City, Mich.:

"We look forward to a material increase in business in 1916. The dyestuff shortage is the only cloud in the

sky that we can see, and every effort should be put forth to make 1916 a white year.

"We believe the tariff should be revised upwards, and an Anti-Dumping Clause passed.

"While we have received many inquiries from foreign markets, we have not as yet made any efforts to secure any of the business, as our domestic trade has been fully up to our expectations."

CHARLES VEZIN, of Hinchman, Vezin & Co., New York City, sole agents for John Blood & Co., Pitman Manufacturing Co., Halcyon Knitting Mills Co., Hetrick Hosiery Mills, Lowell Hosiery Co., and The Novelty Co.:

"The most serious phase of the situation, so far as it affects the hosiery industry, is the famine in dyestuffs. Cannot COTTON help along the propaganda in favor of a 'White Season'? The public should be educated to the fact that dyes will be very scarce and to make sure of non-crocking articles, whites should be favored. Let the color line, which is so effectively drawn in your section, be applied to hosiery, favoring the *whites*, and our troubles will be greatly mitigated. Put all black and colored hosiery in the Jim Crow car and put the white in the Pullmans, the drawing room car of fashion.

"The bane of American business is 'fixed' retail prices. We get up an excellent article to sell to the jobber at $1.75, so that he can sell it to the retailer for $2.10. The retailer in turn sells it to the consumer for 25 cents per pair. When the cost of yarns, dyestuffs and every item including boxes, labels and even pins sends up the cost 30 cents per dozen and we make the price $2.05 we are told 'That puts it out of range.' Instead of advancing the price to the retailer to $2.40 and making the retail price 29 cents, the article is dropped or must be reduced in quality and cost to meet the fixed price. Instead of making 'the punishment fit the crime' we make the crime fit the punishment. This process seems likely to be made impossible by present war conditions and perhaps this extraordinary situation may pull the trade out of this unscientific rut.

"As to the yarn market there is a surplus of yarns, not of cotton, silk, wool or fiber silk yarns, but of paper yarns, that is, *newspaper* yarns about the solution of the crisis in dyestuffs.

"If this war lasts another six months business will be booming so far as *demand* goes. But there can be no satisfactory business without a fairly adequate supply to meet such demand. The world is facing a famine; *we* shall probably not starve, but we will share in a merchandise famine the like of which history has not known. The cost of this war has reached $80,000,000 per day. That means that the wealth of the world, not counting the property destroyed by fire and shell, not counting the economic value of human life, is impaired by a large part of that amount. A large part of our productive energy is engaged in producing, not wealth as in normal times, but something that has no value except to destroy life and other forms of wealth. And whilst we are the most fortunate nation in the world in this crisis (so far) we are turning a part of our productive power into something which has no inherent value except for war, and the money we get in return for it is only added national wealth, provided now or later on we can exchange that money for commodities. Whether an exhausted world will have a like proportion of commodities to exchange remains to be seen.

"However there is no question that we are facing a period of rising prices in this country which usually means great business activity."

HAROLD LAMB, President, Union Manufacturing Co., Union Point, Ga.:

"The present demand for hosiery is good, due in my judgment: (1) Because the jobbers and retailers have allowed their stocks to get down to the vanishing point. (2) Because of the dye shortage they are now stocking up not knowing just what the future has in store for them. (3) The demand has been accentuated by the advance of something like six cents per pound in yarns. (4) Many of our domestic mills have developed a good export trade. (5) Increased wages in the ammunition centers is reflected in the greater buying power of the workers.

"Unless colored dyes are developed in this country, or some combination of available vegetable dyes can be substituted for the present direct colors, such as tan, navy blue, purple, etc., by next summer, the hosiery mills will be able to supply only blacks and whites.

"I cannot but believe however that some method will be devised whereby Germany will consent to the exportation of these colors, realizing that with the probable protection afforded our domestic dyes by Congress that unless the manufacture of colors in this country is choked off, that it means the end of all importations of dyestuffs at the conclusion of the war.

"With an easing up in the demand for ammunition the products of coal tar (now used in ammunition) will be largely diverted to the manufacture of dyes, particularly aniline oil; and with a certain protection we will cease to be dependent upon Germany for this article. Sulphur and direct blacks are being manufactured in constantly increasing quantities, so you can readily see that this spells independence.

"I do not believe that after the war exports of hosiery will continue as we cannot compete with Germany and England, consequently our hosiery manufacturers will turn their attention to domestic trade wholly with a consequent glut in the market with profits cut to the vanishing point by reason of overproduction."

THEODORE F. THIEME, President, Wayne Knitting Mills, Fort Wayne, Ind.:

"We find a very good demand for staple lines of hosiery, and the outlook for spring business is very encouraging. High costs of raw material and dyes will operate against normal profits, as hosiery manufacturers will not be able to get anywhere near the advance needed to cover the advance in costs.

"Substitute dyes in blacks and some colors will be sufficient to take care of immediate demands.

"'After the war, what?' If anybody knows, let them tell."

JAMES J. DANIELL, Treasurer, Marietta Knitting Company, Marietta, Georgia:

"Answering your letter of yesterday will say from the early part of August to the present time we have had a heavy demand for our product and all the business we could possibly take care of. The early part of this year we were greatly inconvenienced by the shortage in aniline oil. For a time we could not secure any. We paid as high as $1.50 a pound for one or two drums but for the

past two or three months have been able to secure a meager supply at 85 cents a pound. The normal price of this article is ten cents a pound. We have had to discontinue several bright colors because we are out of the dyestuff and cannot secure any more. The specimens we have had submitted by various dyestuff brokers have, on analysis, proven to be either very poor dyestuff or badly adulterated by adding common salt. We have not attempted to use any of this class of dyestuff. The aniline oil which we are using for making black is of American manufacture and entirely satisfactory.

"Through the Government's Bureau of Foreign and Domestic Commerce we were introduced to a man in Argentina who has proven to be a good selling agent for us there and since the first of July he has sold and we have shipped over twenty thousand dollars worth of our half-hose to Buenos Aires and Montevideo.

"There is now a strong demand for hosiery and we have a good business booked for spring delivery. The prices, however, are not advanced but very little over what we have been getting when cotton was cheap and dyestuff plentiful. While all, or nearly all other articles have been advancing in price during the last fifteen or eighteen years, hosiery has been greatly reduced in price and improved in quality. All this was done under a high protective tariff and is a great argument to prove that American competition is sufficient to keep the price down.

"After the war the American manufacturers will be put to a terrific test. The people in the European countries will not be able to buy anything except the barest necessities of life and their manufacturers will, therefore, wish to dispose of their product in the United States and in the other countries of the world that have not been devastated by the ravages of war. We anticipate the fiercest competition that has ever been known in the hosiery business, and without reasonable protective tariff, it unquestionably puts our labor in competition with the cheap labor of other countries. It certainly would not do at all to undertake to lower our standard of living to that found in the foreign countries. Our wage earners are getting fair wages now, but not any more than they should and we could not sanction anything that would mean reducing their pay."

LOUIS P. HAIGHT, President, Muskegon Knitting Mills, Muskegon, Michigan:

"The present dyestuff shortage will be serious for a few months, but I believe that the American chemists will develop dye in this country which will make us independent of Germany after the war is over, providing a protective tariff is enacted to prevent the dumping of materials on this market, at a less price than the actual cost of manufacture, to kill American manufacturers and control the industry.

"Like many other manufacturers, I purchased German dyes because they were better or cheaper than the American dyes, and because I did not realize the game which was being played by the German manufacturers, but I trust that a protective tariff will be enacted in favor of American dyestuffs by the present Congress."

J. A. SIMONDS, Treasurer, Winona Mills, New Haven, Connecticut:

"Answering your inquiry as to the present situation and probable prospects for the coming year where the knit goods industry is concerned, we can only say that at no time during our thirty years' experience as manufacturers have we ever received so many domestic and foreign inquiries from people whom we have never sold, as has been the case within the past few months.

"A large percentage of prospective orders we have been obliged to decline, owing to the impossibility of securing dependable dyeing material therefor. The unprecedented condition of the market in dyeing materials is so well understood that further explanation would not seem necessary, unless it is to say that in an attempt to maintain our heretofore high quality of dyes, we have been able to do so only at an increase in the price of dyeing of fully 350 per cent above normal.

"While domestic and foreign inquiries indicate a willingness to pay more for goods dyed with such dependable dyes, still there is a hesitancy in submitting a sufficiently increased price to fully offset the increase in the cost of the goods to the manufacturer.

"Aside from the increase in dyes, we believe it is generally understood that many of the cotton yarns used by hosiery mills are fully 20 per cent higher than a year ago.

"The natural effect of this high cost of dyeing material is, owing to its scarcity, directly restricting the production, or is compelling manufacturers to adopt a grade of dyes in which fastness and stability are questionable. We believe it is generally understood that domestic manufacturers of dyeing materials are doing what they can to increase their capacity and take care of the normal demand. We further believe that present manufacturers, even with large increases in their production, can only take care of a very small portion of the requirements.

"It is our opinion that there is unlimited capital that would be perfectly willing to become interested in the manufacture of the various fast dyeing ingredients, could it be assured of reasonable protection by the Government in the form of a duty so arranged as to successfully cover any attempts, after the war, to flood this country with foreign dyeing materials at a price that would be ruinously low until domestic manufacturers had been driven from the field, or unless this willing capital can be protected by a reasonable, intelligent and understandable anti-dumping law.

"The present hindrances to the textile industry of this country, not only to owners and operators of mills, but to operatives as well, are proving far more costly than any of the Tariff bills of the past, and we believe that any legislator who has the good of the industries or individuals of his country at heart will unhesitatingly advocate and lend his influence to the passage of any equitable bill that will assure our country in the future, from being subjected to the humiliation and loss of business opportunity to either employers or employees such as we have been subjected to, not only in the textile but many other industries, as the outcome of this unforeseen and unexpected Old World massacre."

J. D. MASSEY, Treasurer, Eagle & Phenix Mills and Perkins Hosiery Mills, Columbus, Georgia:

"There is no lack of orders at present; in fact the demand is good. Serious difficulty has been encountered and is yet being encountered on account of lack of dyestuffs. This possibly is responsible in part for the keen demand. That is to say, lack of dyestuffs has curtailed production in one way and another so as to accentuate the demand for

whatever hosiery could be produced. But in addition to that, knit goods are in better demand than for sometime past.

"As to the coming year, of course that is largely problematical. The newspapers have been full of accounts of new dyestuff plants and new dyestuff inventions, the majority of which are mere newspaper talk. It is true, however, that some new dyestuff plants have been built and others enlarged. It is also true that Logwood and other vegetable dyes have been pressed into service to meet the shortage as far as possible. Logwood and all other dyestuffs are up in price anywhere from 400 to 1,000 per cent. This will naturally prove a strong attraction both for an increase in the output of the present works and the establishment of new plants both for vegetable and coal tar dyes.

"If the volume of the knit goods should remain during 1916 about as at present, then it is very probable that the dyestuff supply would increase gradually so as to ease things up in that respect. On the other hand, if the demand for goods were to increase materially, it is probable that about the same relative dyestuff situation would prevail during the greater part of 1916.

"As a whole the mills making the cheaper grades of hosiery have not suffered as much as the mills making cotton piece goods. The reason is that their colors are confined mainly to blacks and browns. Brown can be supplied by Cutch, and black has been supplemented to some extent by Logwood. In addition to that, there were already some coal tar blacks made in the United States prior to the war, and while there has been a distressing shortage, still there has always been some available dyestuff for these cheaper grades of hosiery.

"On the other hand, the piece goods mills, making complicated patterns of many colors and shades, such as ginghams, outing flannels, madras, etc., have been and yet are in a very tight place. Their prospects for the future are much darker than is the case with the knitting mills, for the simple reason that their supplies of these various colors are getting exhausted and almost unfindable at any price. And there is no chance of their being made in America at any early date. The usual range of colors will certainly be exhausted in America in the next few months absolutely, with the exception of the slight amount brought in from England and Switzerland, with the impossibility of making the goods in America on short notice, so that unless the war should end soon, there is bound to be a color famine.

"As to tariff changes, I do not presume to say just what should be done. The thing necessary is to take such action as will satisfy capitalists that they would be safe in investing their money in dyestuff plants in America over a good long term of years. With that done I believe that an American dyestuff industry would develop gradually and even with considerable speed. At best, however, it would be several years before the full range of colors could be produced.

"Regardless of the war, I am strongly in favor of having Congress take such action as to encourage the development of an American dyestuff industry in full, because this country should not be dependent in any such important matter upon foreign supply. Making American capitalists feel safe in investing is simply the problem of passing such laws as will keep German competition after the war from swamping and crushing the budding American industry."

W. H. HARTFORD, Treasurer, Hartford Hosiery Mills, Nashville, Tennessee:

"Taking everything into consideration, the hosiery manufacturer has cause to be fairly satisfied, at least up to the present. The dyestuff shortage caused a very alarming situation and great disturbance in existing methods, nevertheless the manufacturers seem to have met all emergencies, but at greatly increased cost.

"The prospects of the hosiery manufacturer for the coming year are good. There is brisk general demand at steady prices, and the outlook is encouraging to say the least.

"As to the Tariff, it seems to be generally conceded that the present Tariff law must be changed by the present session of Congress. What changes should be made is a very difficult problem, especially at a time like this, when the whole business system of the world is so greatly disturbed. Owing to these disturbed conditions we are in the first place unable to judge what effect the present law would have had on American manufacturers had the conditions been normal. My opinion is that the effect would have been decidedly hurtful.

"I have believed for several years that we should have in this country a permanent Tariff Commission which should be free from politics, and composed of experts. There are vital problems to be considered in framing Tariff laws, but a Commission of the kind I have mentioned could arrive at accurate conclusions and recommend such legislation as will be necessary for a correct revision, either upward or downward.

"Congressional committees are composed of able men, but as a matter of necessity their duties are too diversified, and they have not the time, to devote to a close study of Tariff conditions and besides in many cases they have not had the special training that is necessary. Germany has a tariff commission and France and Japan have their tariff experts. We should also have something similar.

"It has been frequently said that as soon as the war is over, the European nations will flood us with goods at pauper prices. I do not believe this. There was no great surplus in Europe at the beginning of the war and it is hardly probable that there has been any accumulation since that time, moreover it does not appear reasonable that Europe can create an exporting surplus in less than five or six years after it has returned to peaceful pursuits."

JOSEPH FELDENHEIMER, Treasurer, The Roxford Knitting Company, Philadelphia:

"It was David Garrick who said 'Prologues are a loss of time.' The future of the knitting industry in the United States under the present tariff law, gives grave concern to many manufacturers who have reason to fear foreign competition. It has been quite the thing to revile and scorn these defenders of protection who upheld their principles and convictions in the face of a misguided and unfriendly sentiment. Propaganda developed and spread broadcast at the time of the Payne-Aldrich hearings, has been kept alive by vicious peachments until many champions of the tariff for revenue only became convinced for political reasons of their own sincerity. Employers of labor and leaders of industrialism were linked with rich malefactors and government beneficiaries of one sort or another, until no

man could express real protection sentiments without being made to feel that he was beyond the pale. But the world never stands still, and to those who are students of the present trend of things a new vision is afforded.

"The first six months of the Underwood-Simmons tariff law was most disastrous to our industries and nothing save a world's war could have prevented one of the worst industrial panics ever experienced in the United States. Imports in some lines increased within that short space of time by leaps and bounds and there was grave apprehension in the minds of many manufacturers as to their ability to continue in business at all after the European manufacturers would adjust themselves to take over the rich markets of the United States and flood our country with goods sent to us under the lowest tariff rates we have ever had. The European War put an end to the threatened influx of foreign goods,and for the present has brought camparatively good times to many branches of industry in the United States; but what about the future? What's going to happen when the fighting stops and the millions of foreign workers go back to their regular occupation? What of the millions of women workers in poverty stricken Europe who pay no taxes and represent 90 per cent of the productive element in the textile industry? They can and will maintain themselves in a way in which our American workpeople cannot hope to compete.

"My prediction is that shortly after the war ends, we will see the greatest flood of foreign goods coming into this country that we have ever known and with it will come disaster for many lines of textiles.

"The Democratic Party obviously realizes the danger threatening its future after having blighted the country with a political measure of which it should be, and probably is ashamed, has found a loop hole in the form of 'a Tariff Commission,' and would fain take the tariff out of politics, thereby leaving the country hopeless and helpless whilst it makes further experiments upon the unfortunate business men and their work people.

"The position assumed by Democratic Senators and Congressmen during the consideration of the Underwood-Simmons Tariff was one of utmost courtesy, but they knew little and cared to know less. No statement of fact or argument as to the dangers of a deep cut in the then existing rates meant anything to them; political expediency demanded, from their viewpoint, cuts of 50 per cent in the rates and their indifference to the appeals of men who knew the dangers of the proposed changes were ignored, with the result that a crime was perpetuated from which we will be long in recovering.

"Our country should be self-contained, independent and its laws so made as to insure every advantage to its own citizens, from the humblest workers to the leaders of industrial enterprises. We should have a tariff devised by friends of protection and not by a commission which would spend years in its deliberation, and which, if appointed by a Democratic President, would naturally lean towards the lowest tariff rates. What we need in Washington are men who believe in protection to American industries and to American men and women; men who regard protection as the surest means of building up the industries of the country and getting the fullest measure of competition from manufacturers in the country.

"There should be just regard for the rights of men who employ labor as well as labor itself, and both should be permitted to have a voice in regulating tariff rates, which can and do bring about prosperity as much as all the other elements combined.

"We have reason to be apprehensive about our greatness as a nation unless we move in direct relation to our economic needs, our watchword should indeed be preparedness, and this means more than a great navy, a great army and great coast fortifications; it also means industrial preparedness; laws which will give the markets of our own country to the products of our own soil and factory; to the employment of our own workpeople that they may live and enjoy the fruits of their labor under American standards of living."

J. P. SPIKER, President, The Superior Underwear Co., Piqua, Ohio:

"Regarding the dyestuff situation, would say that up to the present time our company has not been materially affected by the prevailing dyestuff shortage, inasmuch as we use comparatively few yarns which require a very large percentage of dyestuff. Fortunately I am strongly covered on practically all of the yarns, and my information from the knitters with whom I have placed business is to the effect that they are amply protected to take care of us for the next twelve months. However, there is absolutely no question but what many knitters throughout the country are seriously affected by the dyestuff situation and many knitters, who have been running largely on colored goods, will be unable to run up to their full capacity, because of the dye situation. This will naturally curtail the use of colored yarns to some extent.

"Our plants are at present fully sold up and we are refusing to accept new business on heavy weight underwear for immediate delivery, inasmuch as our entire capacity is required to take care of the re-orders of our regular customers.

"Our outlook for spring and summer weight business is much better than last year, in fact our sales are largely increased and I have every reason to believe that the first six months of 1916 will show a splendid increase in all lines of business when compared with corresponding months of the previous year. I believe that this will be the case, unless the war should suddenly end, in which event a readjustment would necessarily follow together with a cancellation or a holding up of war contracts going to belligerent countries, which would promptly tend to curtail the volume of business in this country in practically all lines.

"After the termination of the war in Europe it will, in my judgment, be most necessary for us to make a change in our tariff laws, otherwise the general business of the country will be seriously affected within a short time after the termination of the European troubles."

P. H. HANES, JR., Treasurer, P. H. Hanes Knitting Co., Winston-Salem, N. C.:

"We only manufacture men's underwear, which department of the knit goods business has not been affected so seriously on account of the shortage in dyestuffs as has the hosiery business, for the reason that the few colors used in the production of men's underwear require a very small percentage of color; therefore making it easier for the underwear manufacturer to cover his wants for a longer time.

"We do not anticipate material improvement in the dyestuff condition for another twelve months, unless a large part of the shipments that are now tied up in foreign ports are released—the probabilities of which are quite remote at this time. There are certain colors being made by American firms, and we understand these colors are fairly satisfactory, but we doubt seriously if they will be able to develop their plants to the extent of supplying colors in adequate quantities within the next twelve months,—to say nothing of being able to supply a wide range of colors."

E. A. CLEMENTS, President, Globe Knitting Works, Grand Rapids, Mich.:

"It is my opinion that cotton and cotton fabrics will remain about at the prices that are prevailing today, for the coming year. Prosperity has returned, and with it the demand for merchandise. I am not looking for any lower prices at least for the next six months. We are not affected by the dyestuff shortage, and are doing no export business, so are not in touch with the foreign market. As far as we are concerned we need no tariff changes."

G. A. MATTERN, Manager, Gantner & Mattern Co., San Francisco, Cal.:

"At this great distance from the market, we are at a disadvantage in forming a very intelligent opinion as to the future on the dyestuff shortage, as well as the effect of the war on the industry, and the probable prospects for the future twelve months, but what we glean from the published statements as well as from the spinners and dyers with whom we do business, makes us inclined to think that the dyestuff shortage will tend to increase the cost of all unfinished as well as finished textile merchandise. There will also no doubt be a great shortage of merchandise with consequent high prices.

"The future of the coming twelve months is very problematical and the writer would not dare to presume to have any tangible reason for prophesying what the prospects will be, but there is no doubt in our minds that the moment the war is over that this country absolutely needs a high tariff on everything that is made in Europe, Australia, and Japan. Especially must the tariff on Japanese manufactured goods be very high, as we see evidence every day, especially as our World's Fair here demonstrated to us beyond a doubt, that the Japanese are making rapid and strong progress in the manufacture of everything used by Americans. They also have a subsidized merchant marine as well as very cheap labor, and if we wish to keep our American workers employed, we must certainly have a tariff that will not permit the foreigners to dump their goods upon our markets."

J. J. PFISTER, president, J. J. Pfister Knitting Co., Berkeley, Cal.:

"In our judgment there is absolutely no ground for sharp advances in raw cotton because we consider the stock on hand carried over from the previous year, and this year's crop fully sufficient for all the needs in the entire world.

"The dyestuff situation interferes considerably with the use of cotton because some of the very best colors which were used in large large quantities cannot be had, and until the buying public has been educated to using whatever can be had, the movement of cotton yarn will not be very strong."

## The Knit Goods Market.

Hosiery mills in the Philadelphia territory are operating at 85 to 90 per cent capacity, according to a composite report based on information obtained from a number of manufacturers. This estimate is, in a way, borne out by takings of yarns.

The underwear trade appears to be in a better position. Jobbers report a good demand and mills, in most instances, are very comfortably situated both as to duplicate business and bookings for 1916 heavy weights.

Probably the most unsatisfactory branch of the knit goods industry is that devoted to sweaters. Business for deliveries six months hence is being accepted at high prices subject to unforeseen adverse circumstances, and many of the better mills stipulating that they are bound to deliver only pro rata of their production.

This safety clause in the order confirmation is inserted because of the uncertain dye situation and the possibility of a shortage of some varieties of yarns, notably worsted and artificial silk. Should there come a price recession and a flow of colors, manufacturers admit, there may be expected a flood of cancellations threatening many weaker concerns, the first to break prices and the last to insist upon acceptance of delivery.

The dye shortage is one of two underlying reasons why hosiery mills are not being run at more nearly 100 per cent capacity. The other is a labor shortage in sections where munition factories have sprung up or enlarged their facilities. New England is reported the greatest sufferer from this cause.

The situation in the hosiery industry as a whole is held by many close observers as strengthening previous predictions of a knit goods shortage early next year. The belief is gaining ground among manufacturers—notably of hosiery—that much of the merchandise sold for spring shipment will not, or, in other words, cannot be delivered; that thousands of cases of stockings in white will have to be accepted by houses which affect to feel secure in deliveries of colors.

Some few manufacturers report that they are getting reasonably good sulphur black, in fair quality, and their deliveries to customers confirm this. On the other hand, there are important mills actually confronted by a dye panic. As viewed by some persons in the trade, there is only enough black on the market to make the situation aggravating. That it may become more tense is indicated by a statement by the president of the largest dye producing company in the United States: "The situation of the dyestuff business is that it is getting worse all the time." This discouraging information from an authoritative source was vouchsafed to a hosiery manufacturer in response to his inquiry as to why he was not receiving deliveries in better quantity.

A recent anouncement by an important Pennsylvania underwear concern of an advance of 12½ cents through the range of women's vests and drawers and 25 cents on union suits in the last week brought a deluge of letters from manufacturers in the various underwear centers approving the reasons set forth for the higher prices and pledging like actions. It is apparent from the tenor of

the letters that merchandise not yet bought for 1916 will present new values.

Higher costs of not only materials, but also packing cases and paper boxes are given as justification for higher mill prices. There must be taken into consideration also, particularly in Pennsylvania, the additional burden imposed upon manufacturers under the Child Labor and Compensation laws, effective January 1, 1916.

Another item in increased cost of production is the machinery shortage with higher prices as a sequence. The Grosser Knitting Machine Company announces that it cannot land machines in this country, and therefore is not making delivery of equipment ordered in May. No machine needles are coming from abroad, and this country's production is estimated at only sixty per cent of domestic demands. In face of this, imported machinery and needles are going from the United States into Canada, and thence, presumably, to England or British colonies, all of which points toward higher cost of equipment.

In spite of apparent obstacles the knitting trade crosses the threshold of 1916 believing in a bumper future, and this is forecasted in advance buying. One important underwear mill, with several branches, is sold up to November next, is opening no new accounts and has withdrawn its line. This concern's Eastern manager states that the orders from one of its customers are 2½ times above the aggregate last year at this period, and fully 50 per cent above normal. While this, no doubt, is exceptional, there are other instances of record-breaking buying.

"We look for a killing next year," is the way another optimistic mill manager puts it, "and prices must go upward," he continued. "Everybody that wants work is employed; we've had big crops which sold at high figures, and we may look for exceptional business from the South."

In this person's opinion the South has bridged the chasm and has money to lend, and being a freer spender than the North, he looks for the cotton section to figure conspicuously in contributing to next year's enormous value of business.

Except for the fear that the war may end before the United States is prepared for peace, factors in the knitting trade agree that the outlook never was brighter, while the present, save for the shortage of dyes and inadequate shipping facilities is satisfying to that element which keeps the bright side of the picture to the front.

## The New Klauder-Weldon Shop.

Yardley-on-the-Delaware, a few miles from Philadelphia, has been selected by the Klauder-Weldon Dyeing Machine Company, of Amsterdam, N. Y., as its future base of operation. The continued increase of the company's business in dyeing, bleaching and scouring machinery has compelled an increase in manufacturing space and a larger plant. The company, therefore, will remove to Yardley, where will be erected a structure of stone and steel 78 x 111, one story high, which will be used as a foundry in conjunction with the buildings already purchased in Yardley admirably suited for the purposes of the company. There will be added a two-ton crane for handling heavy work and brass and iron cupolas, with an elevator for hoisting material to the cupola platforms.

## The Manufacture of Fashioned Knit Goods.

BY WILLIAM DAVIS, M. A.

PART EIGHT.

CARD CUTTING.

It is a matter of opinion as to whether the manufacturer should cut his own cards or send them out to a place where they have the suitable apparatus for punching the holes. Fig. 8 is given for the purpose of demonstrating the working of the cards on the frame under consideration, being a side view of a lace point as arranged over the needles of the frame, with the barrel and lace cards above the machine. The apparatus consists of the jack J with the lace point P attached, the jack resting with its upper end on the bar K and being regulated and kept securely in position by the spring L which has the effect of preventing vibration of the lace points. Above the jack is placed the dropper S which is a lever having its fulcrum or working point at M and made up of four portions R, T, W, and F,

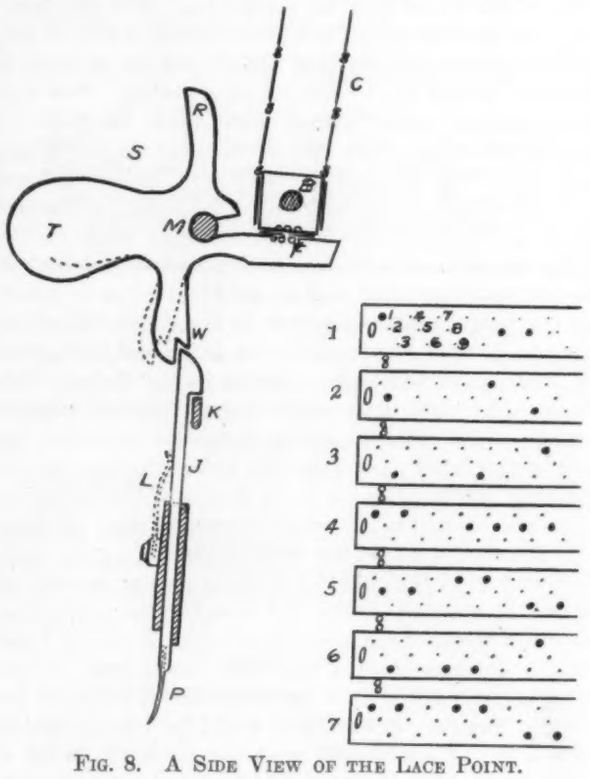



FIG. 8. A SIDE VIEW OF THE LACE POINT.

each of which has a separate and important function to perform. The part W is made to fit on to the top of the jack and give it its downward motion over the needles, the part T by its extra weight contrives to keep the part F with its fingers pressing against the barrel B. The part R is used for bringing the dropper into the inoperative position.

The cards are hung over the cylinder B which is arranged to give a full turn at each course and the cylinder is hollow, so that if a hole is produced in the card, the finger of the dropper succeeds in gaining access to the cylinder and so keeping the part W of the dropper over the top of the jack. If however there is no hole cut in the card, then

the finger or point of the part F cannot penetrate the cylinder and the dropper is at once swung into the dotted position out of contact with the jack so that no motion of the latter can be effected. All the droppers descend after each course has been worked, the bar M moving down in its entirety, those droppers which have been permitted to penetrate the cylinder push down the jacks over which they are placed, but if the absence of a hole in the card has swung the dropper into the dotted position, then the dropper misses the jack and the needle corresponding is untouched by the point. When the points have been selected by the Jacquard mechanism and the bar M descends, the concluding movements are identical and brought about by the same apparatus as that used for fashioning and this tackle has already been described in an earlier article. The points descend over their corresponding needles and the grooves underneath the lace points fit exactly over the beards or springs of the needles. Points and needles descend together to slip the stitches from the needles to the points, the latter then rise and obtaining a sidewise shogging motion are again sunk over the adjoining needles where they leave their stitch and again ride to the normal positions. Certain predetermined needles have, after this fashion, been emptied and their rightful stitches added to the neighboring needle which now has two stitches as against the space formed by the removal of the stitch. This dislocation of the normal looped fabric forms the basis of the very attractive ornamental effects produced and which enjoy such wide favor for the articles of hosiery de luxe.

From what has been described as the motion of the lace points it will be understood that for every mark on the design paper a hole will require to be made in the card at the corresponding point and the card cutter has to follow out the design, course by course, in a horizontal direction, cutting a hole for every mark in the design and leaving uncut those parts which show blanks in the design. This follows the general usage common to all Jacquard selective mechanism, but from reasons of mechanical suitability, the card cutting is not quite absolutely straightforward for the following reasons: Owing to the density of the lace points in the machine and to the general fineness of gage, the droppers are acted upon by the cards at slightly varying positions at F, with the object of ensuring greater accuracy of motion of the lace points and also for the purpose of taking the strain from one narrow strip of the card and distributing same over a somewhat larger area. If the holes of the pattern were cut across the card in the one straight line then the tendency would be very decided to have a line of considerable weakness across the center of the card at which place it would tend to bend and break. This disadvantage can be easily overcome by cutting the card along two or more lines and having the feeler fingers F of the dropper arranged accordingly.

For the machine in general use, about 30 gage, the feeler points are arranged in threes as shown in the diagram dropper 1 having its feeler farthest to the right, dropper 2 having its feeler in the center position and dropper 3 having its feeler in the position most to the left. So the points are riveted on to the droppers, every third being similarly disposed in the first, medium or third positions as required. To correspond with this arrangement the card punching machine has to be arranged in treble rows and the cards be of suitable width and length.

To demonstrate the method of the actual cutting of the cards for such a treble arrangement of points, Fig. 8 shows cards marked 1 to 7 with a portion worked out for points 1 to 21, and on these the beginning of the first 7 courses of design 12 have been marked out. The start will be seen from the bottom upwards, the horizontal lines representing courses and the vertical lines representing needles counting from left to right. On the first card the holes 1 to 9 have been numbered and these will be found to correspond with the markings on the first course of the design, a black circle indicating a hole cut in the card and a dot showing the position where the card will be uncut. If the courses be taken in succession from 1 to 7 reading from left to right in a horizontal direction the cutting of the cards can be easily followed and the principle learned of the completing of the process. The operation is continued along the full extent of the card, when the first 56 points have been cut as giving a repeat of the design, then the 57th is cut as 1 and so on repeating the design over the whole card for the full width. The part marked K being the ground and occurring many times over in the course of the lace top will require to be repeated on the cards a number of times over according to the length, but the parts M and N occurring only once in the lace top need only be cut once. The design complete, the cards are strung together and hung over the frame in the most convenient manner, so that the hampering of the operator may be reduced to a minimum.

When the lace top is completed, the frame is arranged to repeat this for any number of times according to the orders in hand, for as already mentioned, it is not usual to make the entire garment on one frame. The machine produces lace tops continuously until the requirements are met and it seldom occurs that the firm is able to keep the frames in constant employment having periods of seasonal idleness. If the frame is only of one gage then the lace tops have to be adapted to garments of varying gage. It is not usual to attach such ornamentation except to articles finer than 20 gage and if the garment be made of 20 gage and the 30 gage lace top has to be transferred to the bars to have the garment worked on, then it takes a judicious arrangement of the loops so that the correct width be occupied, two stitches having to be placed on the one needle at certain intervals, and when the body of the garment is worked on, the keen observer can notice where the join has been made but the defect is not usually serious to the casual wearer.

## Needle Breakage and the Cause.

BY "BOB."

Knitting machines, like watches, cannot be judged from first cost entirely, as the upkeep requires a certain percentage of expense for renew parts, etc. This is largely due to the make and the materials used.

In recent years knitters will observe the elimination of cast iron in the construction of circular frames, this material being replaced by malleable iron parts. A wonderful advantage is obtained by this feature. A part may be a trifle out one way or another and by careful bending it can be brought to the desired shape and position. This cannot be accomplished with cast iron. But the knitting

needle still remains tempered steel and at times, owing to some failure in the process, we find them fairly soft.

A soft needle is not a practical feature. With soft needles, slubs of yarn, and yarn of hard twist will soon bend them and their life is short.

A large amount of money is expended yearly by the knitting mills to renew needles. However, do not condemn the needles until you are sure the needles are at fault. The adjustment of the machines may be wrong, or the yarn defective. If the grade of yarn used is too heavy it will fill up the hook, and sometimes the latch endures such a strain as to bend the latch or break it off entirely.

The camming of the machine has a very great deal to do with the needle giving satisfaction. Having the cams spaced too far, or having too much play, or the traverse space too narrow for the butts of the needle to course in, will certainly make a short life for the needles.

In camming a head for seamless hosiery, to reciprocate on heal and toe, see that both stitch cams are of the same length, or that they draw even stitches on both forward and backward motions. If they don't, then don't wonder why the heels look uneven when finished.

Speed also has a tendency to affect the needles. There is nothing gained by attempting to get increased production by overspeeding the machines. Just like men, the more you go to hurrying them or crowding them the sooner you can look for bad work, or a breakdown. The knitting machine manufacturer will give you the proper speed to run the machine to secure the best results. It is much the best to obey him as he is in a position to know.

A gage will be furnished by the needle manufacturers to enable you to determine whether the needles are of the proper temper. You will then be able to test each lot, and thereby tell whether they will stand the necessary strain.

A rough latch ring will cause you grief by bending latches and hooks.

A loose cam, or a rough cam, or a screw too long in the cam bearing on the cylinder will break needles.

Always see that the latch ring does not touch the needles and that it runs perfectly true, otherwise it will be too far away on one side, and probably rub on the other. This also is hard on needles.

On the ribbers a needle of short length is used on the dial, and ordinarily these are the ones to break, more so than the cylinder needles. Very often the cause is from setting the yarn carrier too close. It is best to allow enough space to clear the needle, and not any higher than enough to allow the dial needle latch to open.

In the loose course device the attachment should be so adjusted that when in operation it does not raise too high, as it will raise the needle too high, perhaps out of the slot, thereby breaking the needle, perhaps many of them. Also see that it does not project too far into the dial or it will squeeze the hooks.

See that the dial cap does not fit too tight on the dial. Allow a *little* play and see that the cams are tight and smooth.

Always turn the machine by hand after setting the loose course device, or after dropping the dial, *it will save needles.*

Be sure and see that welt leaves are set right. A bad smashup can be avoided if they are given strict attention. Notice that they don't bind on the butt of the needles, as a broken cam or more broken needles will result.

Keep the cylinder and dials clean at all times, as the needle slots are cut to take a needle and no space is allowed for dirt. The small space is for oil, not dirt, so be sure to feed a little oil.

If the welts on the ribbers appear rough or drop stitches, you had best see if the dial is clean, especially behind the slots near the spindle. Bear this in mind.

Buy good needles and keep the machines clean. Use good oil, not too much, but enough to lubricate.

It is a good plan to put tickets on the machines, numbering the machine and ticket the same; Then have the operator and fixer mark down each needle replaced. Collect these tickets each pay day and look them over, thereby seeing which machine needs the most attention. Thus you will find the machines breaking the most needles.

On the ribbers, mark whether it is cylinder or dial needles that were broken, then it can be seen at once where the needles are going, and get someone after the trouble.

Careful attention to these points systematically followed up by the use of tickets will show a needle saving at the end of the year worth talking about.

## KNITTING MILL NEWS

**Notices of mill projects, additions or improvements are solicited for this department. Other notices pertaining particularly to the Southeastern section will be found in the Southern Mill Situation review.**

INDIANA.

FORT WAYNE. The B. & B. Knitting Co. has contracted for the erection of a new building 40 x 20 feet, two-stories, with basement, of brick construction. This company was incorporated last February for $10,000.

MASSACHUSETTS.

SPRINGFIELD. A reduction has been made in the working hours of the Potter Knitting Co. to 8 hours a day. In connection with this reduction in hours a 10 per cent increase in wages has been given in all departments. Men's, women's and children's underwear and fancy knit goods are manufactured.

MICHIGAN.

COLON. Arrangements have been made by the Lamb Knit Goods Co. to take over the business of the Three Rivers (Mich.) Knitting Co.

NEW YORK.

FORT JOHNSTON. Fire on Dec. 2 destroyed the branch of the Morris Mills, the loss being estimated at about $200,000. The main plant of this concern is located at Amsterdam. At Fort Johnston men's flat underwear, sweater coats, etc., were manufactured.

NEW YORK. The Northern Knitting Mills, manufacturers of sweaters and fancy knit goods, announce that they have leased four floors in the Alexander Building, Sixth Avenue and Nineteenth Street, where they will remove their plant from its present location, 648 Broadway, allowing them about three times the amount of space used in their present quarters. The knitting capacity has been doubled

and extensive additions made to the fancy knit goods and hand crocheted spencers and house jacket lines.

OSWEGO. A hosiery mill is understood to be considering the purchase of the plant of the Mohawk Manufacturing Co.

PENNSYLVANIA.

PHILADELPHIA. Application has been made for a charter for incorporation under the laws of Pennsylvania as the Quality Knitting Mills, for the manufacture of knit goods. Isaac Hassler requests the charter.

PHILADELPHIA. The Norma Knitting Mills with 20 full fashioned frames have leased the top floor of the tenement mill at 3rd and Huntington Streets. The mills, which will be incorporated, will manufacture a line of women's full fashioned silk hosiery which they will sell direct.

PHILADELPHIA. Brownhill & Kramer, operating 40 round frames, 450 knitters and 94 ribbers on men's and women's hosiery and half-hose in cotton, lisle and silk, with a dye, bleach and finishing department at Memphis Street, East Columbia Avenue and Orange Street, have recently purchased, adjoining their mill on Memphis Street, a lot measuring 109 feet. This will be covered by a two-story brick mill to be used as an addition to the present plant.

PORTLAND. Kistler Bros., of Stroudsburg, have opened a branch knitting mill at this point owing to a lack of help in the former city.

RHODE ISLAND.

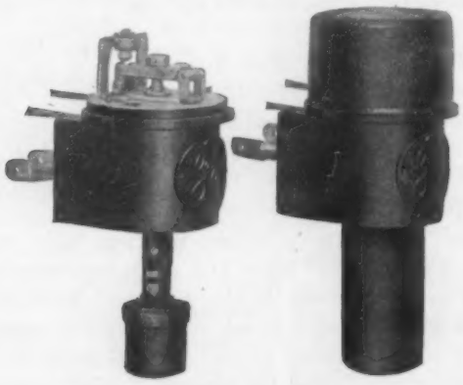
PAWTUCKET. P. Garvan, Inc., of Hartford, Conn., has purchased the plant of the Sakonnet Knitting Mills, the purchase price being $13,200.

## Protection of Alternating Current Motors.

In alternating current motor installations it is a common practice to provide means for automatically disconnecting the motor from the circuit in the event of sustained overload. It is also usual, except in the case of some small motors which can be thrown directly on the line under load, to cut the motor out of circuit when the line voltage drops to a certain predetermined percentage of normal.

To provide for overload and low-voltage protection of a-c. motors up to 2,500 volts and 300 amperes, the General Electric Company has developed a new relay for use in conjunction with the usual type of G. E. low voltage release.

This relay is mostly employed with motors using self-contained compensator control, but sometimes for switchboard service when both low voltage and time relay overload protection are required. Here series relays replace the secondary relays, current transformers and oil switch tripping coils otherwise required.



TIME LIMIT OVERLOAD RELAY.

The new relay is a vast improvement over the one previously manufactured. The contacts, dashpot and calibrating tube are inclosed by dust-proof stamped steel covers. Current and time adjustment are accomplished outside of the dashpot simply with the aid of a screw driver. The settings are constant, for an adjusting nut is locked in place after each setting is made.

## Calendar Notices.

The Draper Co., Hopedale, Mass., are sending out their 1916 calendars. While the design is slightly different than that of 1915, it still embodies the cotton plant with the open white bolls thereon. At the top of the card is a colored reproduction of the well known Northrop loom, while at the bottom is a bird's-eye view of the works and village at Hopedale, Mass.

One of the most complete and convenient desk calendars seen this year is being distributed among his customers and friend by James H. Maxwell, of Greenville, S. C., Southern Agent for the Keever Starch Co., of Columbus, Ohio. This calendar carries a tab card for each month in the year on which is printed in light face type the entire number of days of the month, above which appears a single sheet for each day, which not only gives the day of the week and month, but also gives the other days of the month in light face type, which have preceded the day represented by that particular sheet. This calendar is especially adapted to the making of notes, as are many of the loose-leaf styles, but it also acts as an automatic "tickler" record for the many necessary things a business man needs to remember at exactly the proper time. Moreover, it is a constant daily reminder throughout the entire year that this unique silent helper was presented with the compliments of the manufacturers and the southern representative of Victor Mill Starch.

It will be remembered that last year the Stafford Company of Readville, Mass., sent their friends and customers a desk calendar made of heavy brass plate and supporting a removable calendar pad. On the front of this brass plate was etched a Stafford "Ideal" automatic loom in polished brass and green on an enameled background. This year this company is sending out a new calendar pad for the year 1916 suitable for attaching to the brass pad holder.

A. B. Carter, the southern representative of the Victor Shaw Ring Traveler Co., of Providence, R. I., with southern office at Greenville, S. C., is sending out a 1916 calendar in the form of a vest-pocket leather bound note-book with a calendar on the inside front cover.

The Windsor Print Works of North Adams, Mass., are sending to the trade a Christmas souvenir in the form of a copper match-box holder.

## Clinton H. Scovell & Company

**Certified Public Accountants**
**Industrial Engineers**

110 State Street, Boston, Mass.
Woolworth Bldg., New York, N. Y
Stearns Building, Springfield, Mass.
Edison Building, Chicago, Ill.

**Textile Cost Accounting**

**You Will Be Delighted With**

## Howe Mill Crayons

**Try Them and See**

## Howe Mill & Crayon Co.,

LOWELL, MASS.

**Free Samples on Request**

## SHAMBOW SHUTTLE

**Superintendent:**
There! This fabric is coming along very much to my liking. You gentlemen must maintain this present quality production.

**Cloth Room Overseer:**
I'll be pleased to do all I possibly can to keep up my end. Keep the cloth coming as well woven from the looms. The fewer weaving defects lately have certainly meant less work in burling and sewing.

**Overseer of Weaving:**
I'm satisfied that the change for the better in my weaving is due to my new Shambow Shuttles. I've seen shuttles which cost more, favor loom production less. It paid to have the Shambow people combine their ideas with my specifications so as to produce an efficient shuttle for my weaves.

**SHAMBOW SHUTTLE COMPANY**
Woonsocket, R. I.

Confer with us to the end that we may effect a weave room economy for you.

SAFETY FIRST — ECONOMY renewable cartridge FUSES

WHY spend four times more than necessary for Annual Fuse Maintenance? Some of the large mills of the cotton industry have realized that electrical protection may be secured at a saving of 80% a year over old-style methods by using

**ECONOMY**
**renewable cartridge**
**FUSES**

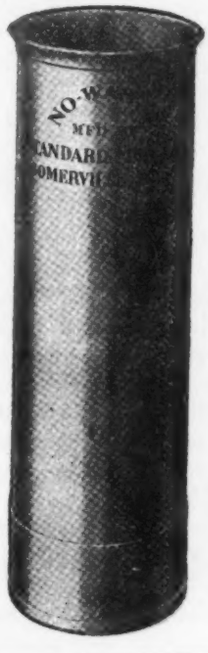
**Glad to send free samples to any engineer, electrician or plant manager in the cotton industry. Ask for list of users and Bulletin No. 7.**

## ECONOMY FUSE & MFG. CO.

**Kinzie and Orleans Sts., Chicago.**

**"Look for the Gray Shell."**

## "No-Waste"
## Seamless Roving Can



is acknowledged to be the best constructed and most durable can on the market.

Seamless throughout, made from pure vulcanized fibre, no joints, no rivets or seams, makes it almost indestructible and light in weight.

Absolutely smooth inside and outside. Finished inside with two coats moisture-proof preservatives, outside with two coats durable and attractive enamel.

We also manufacture Mill Boxes, Doffing Trucks, Fibre and Steel Clad Cars, and special mill products for any purpose.

May we quote you prices. Write today for circulars.

## Standard Fibre Co.

**Somerville, Mass.**

# BOOK REVIEWS

**All Books Reviewed Under This Heading May Be Procured From COTTON at the Published Price.**

A HAND-BOOK OF WEAVES. By G. H. Oelsner, director of the weaving school at Werdau. Translated and revised by S. S. Dale. 402 pages. 1,875 illustrations. Published by the MacMillan Co., New York. Price $4.50.

This is a complete and accurate translation of a book, which, in the original German, has gone through many editions and is considered one of the best presentations of the subject in any language. It contains a clear explanation of the construction of weaves for dobby or harness looms. The many illustrations of weave drafts use several different methods to indicate the interlacing of warp and filling. The volume includes weaves for single and double fabrics and also for three or more ply cloths. To the original text the translator has added a supplementary chapter on the analysis of weaves and fabrics. Anyone interested in the textile industry either as a student or as a practical worker, will find in this book much information hitherto obtainable only with difficulty.

INVENTIONS AND PATENTS, by Philip E. Edelman. 288 pages. Published by the D. Van Nostrand Co., New York City Price $1.50 net.

This volume is intended particularly for persons interested in patents either as inventors or investors. Many patents are unwisely applied for and taken out, a large part of which never pay the patentee for the time and money required. It is the purpose of this book to point out and make plain the laws intended to give patentees their rights. The questions involved are complex and should frequently be considered from many view points. In this book the author has explained in every day terms these legal difficulties and not only considers the patentability of inventions, but also discusses the various points of patent procedure, infringements, disposing of patent rights, points about foreign patents, and a great deal of other co-related material of interest to those intending to patent an invention of their own, or invest in an invention of some other person.

DOCKHAM'S GLOVE AND MITTEN MANUFACTURER'S REPORT AND DIRECTORY FOR 1915. Twenty-six pages, bound in paper, published by the Dockham Publishing Co., Boston, Mass. Price $1.00.

This directory is the fifth edition and covers glove and mitten manufacturers in the United States and Canada. It shows the kind of gloves and mittens manufactured and the materials used; the number of sewing-machines and kind of power; the New York City offices and whether or not such manufacturers sell to jobbers or retailers. The directory is arranged alphabetically by states, cities and firms, and the street and number is given.

ARITHMETIC OF ELECTRICITY. By T. O'Conor Sloane. Twenty-first edition, 162 pages, published by the Norman W. Henley Publishing Co., New York. Price $1.00.

In this work in the problems of electrical engineering and practical operations are investigated upon an arithmetical basis. It is believed that such treatment gives the work actual value in the analytical sense, as it necessitates an explanation of each problem, while the adaptability of arithmetic to readers who do not care to use algebra will make this volume more widely available.

"AMERICAN COTTON CROP MOVEMENT" is the name of a little booklet recently turned out with the compliments of Hubbard Bros. & Co., cotton merchants, Hanover Square, New York. This booklet is based on reports of the New York Financial Cronicle, The New York Cotton Exchange and the United States Agricultural Bureau, and is published annually by this firm as a reference book for their friends and customers. It may be secured on application.

The C. W. Hunt Company, Inc., West New Brighton, N. Y., are sending to the trade a new conveyor catalogue W-15-4. This catalogue, which is 6 x 9 inches in size and has 51 pages, contains specifications of a Hunt pivoted bucket conveyor with half-tone illustrations and drawings giving conveyor details valuable to engineers in laying out a boiler house. They will gladly send a copy of this catalogue to anyone sufficiently interested to write them requesting a copy.

Two very interesting reports recently issued by the Department of Commerce at Washington are as follows:

Special Agents Series No. 106 entitled "Banking Opportunities in South America." By Wm. H. Lough, special agent of the Department of Commerce; and Miscellaneous Series No. 29 entitled "The Women's Muslin-Underwear Industry," which embodies a report on the cost of production of women's muslin underwear in the United States.

## Announcement.

On January first, 1916, the name Holophane Works of General Electric Company was changed to Ivanhoe-Regent Works of General Electric Company. This change was made necessary by the expiration, on that date, of the contract through which the General Electric Company possessed exclusive right to manufacture and sell Holophane prismatic glass.

The General Electric Company will continue to manufacture and sell Regent glass and Ivanhoe metal reflectors; and although its right to handle Holophane prismatic is no longer an exclusive one, it will continue to furnish this line also.

In its organization the Ivanhoe-Regent Works of General Electric Company is in every respect the same as that hitherto known by the name of Holophane Works of General Electric Company.

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Commercial Agent R. M. Odell, who has recently been in Singapore investigating the market for American cotton goods, reports that the representative of an American firm which acts as general representatives of American manufacturers in foreign fields has recently placed an order for $3,000 worth of cotton goods, and states he believes additional business can be done. He has opened an office in Singapore and this is expected to be a factor in increasing materially the importation of American textiles. Mr. Odell is reporting fully on the situation and the information he sends will be published shortly after it is received.